SRI BALAJI VIDYAPEETH

(Deemed to be University Declared u/s 3 of UGC act 1956)

Accredited by NAAC with 'A' Grade

Pondicherry – 607402.

www.sbvu.ac.in

MAHATMA GANDHI MEDICAL COLLEGE & RESEARCH INSTITUTE, PONDICHERRY

SHRI SATHYA SAI MEDICAL COLLEGE & RESEARCH INSTITUTE, KANCHEEPURAM DT

FACULTY OF ALLIED HEALTH SCIENCES

B.Sc. OPTOMETRY

2019 -2020 ONWARDS

FIRST, SECOND & THIRD YEAR SYLLABUS AND REGULATIONS

CHOICE BASED CREDIT SYSTEM (CBCS) PATTERN SYLLABUS

(As approved in the Academic Council at the meeting held on 22-05-2019)

Revisit of the syllabus and Examination pattern

(As approved in the Academic Council at the meeting held on 28-09-2020)

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FOREWORD

In recent years, several innovative and need based undergraduate courses in the realms of Faculty of Allied Health Sciences have been promulgated. These courses are primarily oriented towards augmenting the Core academic courses in the Health Care sector.

Although, Allied Health Science courses are in place at several institutes county wide, mention must be made of the fact that only a few Health Science Universities offer courses in Allied Health Sciences under a holistic umbrella. It is in the fitness of things that Allied Health Science courses are being offered in Nodal and Thrust areas at Sri Balaji Vidyapeeth starting from Certificate programme through Doctoral studies.

The Undergraduate programme of Allied Health Science courses leading to B.Sc degree has been very carefully planned taking all the three components into due consideration, namely academics, patient care and research. Competency assumes great importance as the graduates coming out of these programmes would either directly or indirectly assist the Clinicians in day to day activities.

With this in view, the thrust has been laid on a common syllabus for all B.Sc programmes during the first year of study. These subjects offered in the first year are oriented Basic Medical Sciences, besides English as a mode of communication which is vital for affording Global Placements to our successful candidates. Furthermore all programmes are designed in Choice Based Credit System (CBCS) made to suit the convenience of the students. The proficiency and competence of the Undergraduates is fortified by the promulgation of a unique internship cum research programme.

I wish all students success in their studies and career.

Prof. N. Ananthakrishnan

Dean – Faculty, SBV

POLICY ON COURSES OFFERED UNDER FACULTY OF ALLIED HEALTH SCIENCES

PREAMBLE

Sri Balaji Vidyapeeth, Deemed to be University, established under Section 3 of UGC Act, 1956, Accredited by NAAC with A Grade offers various courses under the Faculty of Medicine, Faculty of Dentistry, Faculty of Nursing Sciences and Faculty of Allied Health Sciences.

"Allied Health Professions are a distinct group of health professionals who apply their expertise to prevent disease transmission, diagnose, treat and rehabilitate people of all ages and all specialties. Together with a range of technical and support staff they may deliver direct patient care, rehabilitation, treatment, diagnostics and health improvement interventions to restore and maintain optimal physical, sensory, psychological, cognitive and social functions." - Organization of International Chief Health Professions Officers (ICHPO).

In March 2011, the Ministry of Health and Family Welfare nominated the Public Health Foundation of India (PHFI) as its technical partner and constituted the National Initiative for Allied Health Sciences (NIAHS) secretariat with a mandate to develop a framework to improve allied health training, education and regulation in the country. (Yet to be notified by Government of India).

Sri Balaji Vidyapeeth has introduced several innovative need based courses under the Faculty of Allied Health Sciences at Undergraduate and Postgraduate levels keeping in mind the initiative of Ministry of Health & Family Welfare, Government of India. In an era marked by expanding global job opportunities, these courses are bound to create an awareness among the students to suit themselves in the Health Care Team. Curricula have been designed in an objective manner and are aimed at cognitive, affective and psychomotor domains of learning. Furthermore all courses are designed in Choice Based Credit System (CBCS) made to suit the convenience of the students.

The Undergraduate courses mainly concentrate in creating professionals who form the part of the Health Care Team. The role of these professional is to ably assist the doctor in treatment as well as prognosis and in many a times form the core professional of the team. The proficiency and competence of the Undergraduates is fortified by the promulgation of a unique internship cum research programme.

The Postgraduate courses mainly aim at shaping a graduate into a full professional. Also these postgraduate courses help the graduates as well as the postgraduates to acquire specific skills on various adjunct therapies and techniques.

SUPPLY AND DEMAND

The starting of the new courses will entirely depend on

a. Demand for the course as seen by the enrolment at other institutes.
b. Employability after the qualification.

At present, the shortage of quality human resources is one of the major challenges faced by the public health domain in India. To redress the imbalance in human resources, the Working Group on Medical Education Training and Manpower Training of the Planning Commission (1984) prioritized training of para-professional and auxiliary personnel as follows:

- Training and development of auxiliary health professionals
- Training and development of para-health professionals
- Basic and pre-service/induction training in health care and health management
- Continuing education in health profession education.

Many new health occupations (Physician's Assistant, Optometrists, Medical Imaging Technologists, and Laboratory Technologists etc) have access over several common features in Allied Health Sciences including Basic Medical Sciences which are being effectively addressed. These processes have received support from administrators who are constantly searching for economic qualified and quality labor.

Service users are becoming more empowered through the consumerism of health, which has resulted in better access to information and user-consultation in service development and delivery. Each of these factors has the potential to influence the roles of existing professional groups and presents a challenge to workforce planners. In India, students are not aware of all the allied health courses available in the medical education system. Their career choices are generally influenced by their parents and peer groups, who themselves are unaware of the prospects in this area. By understanding that an entry-level position is just a first step, youth can realistically plan for their future and have a better understanding of what is needed for long-term success. This approach also benefits employers who need a steady inflow of workers at all levels of their organization.

POLICY ON ELIGIBILITY, ADMISSION, & COURSE DURATION OF UG DEGREE COURSES

At Sri Balaji Vidyapeeth, we empower the departments of all the constituent colleges to contribute to the development of innovative, need, value based and job oriented courses taking into considerations the interests of the stakeholders.

The Undergraduate Degree courses (B.Sc.) are presently being offered under the Choice Based Credit System (CBCS) mode as per the Guidelines of UGC. The duration of the course will be Three years with a compulsory internship of 1 year (Non Stipendiary) in any of the tertiary health care institute of the University/ Trust. The proficiency and competence of the Undergraduates is fortified by the promulgation mandatory for appearing at the University Examinations. The maximum time limit for completion of the course will be Six years. However, the Dean / Principal, AHS has the discretionary powers to extend the course duration on valid grounds (Health, Maternity, Natural Disaster, etc.).

The First year of B.Sc. (AHS) courses will be common for all the disciplines. Though the disciplines will be provisionally allotted at the time of admission itself, upon

successful completion of the First year the candidates may opt for a change in the discipline or the college which will be permitted depending on the vacancy and on merit based on the First year marks.

Fourth year – Internship Programme

One-year compulsory internship in various intensive care units, outpatient departments, research center under Sri Balaji Vidyapeeth during which the students get to hone the skills and knowledge acquired in the three years of study. This year ensures their readiness to approach a patient in any setting. The students should also complete a short duration project (in their areas of interest) and also maintain and submit a log book. The degree will be awarded only upon the successful completion of the course including the internship period. The one-year compulsory internship includes postings at the respective department.

Eligibility for Admission

A candidate seeking admission in the B.Sc. Allied Health Sciences courses shall be completing the age of 17 years as on December of the admission year. The candidate shall have passed the Higher Secondary Examinations conducted by the State Board or the Central Board or its equivalent. The candidate should have studied English as one of the papers and passed the same. The candidate should have had Biology, Physics & Chemistry and have passed the same in their qualifying Examinations. Mathematics as a subject is mandatory for B.Sc. Optometry, Medical Imaging Technology and Clinical Research.

The candidate should have secured 50 percent as aggregate in the subjects of English, Biology, Physics and Chemistry at the Higher Secondary Examinations. A relaxation of 5 percent in the minimum required (50%) shall be awarded to the candidates belonging to SC/ ST communities and physically challenged candidates (Disability more than 40%). The candidates seeking relaxation should necessarily submit the relevant certificates issued by the concerned Government authorities while applying for the course and mention about the same in their application.

Lateral Entry

Candidates who have Diploma of Two years in the concerned subject from a recognized University can seek Lateral Entry to the second year of the concerned courses provided that they have studied Anatomy, Biochemistry, Physiology, Microbiology and Pathology as individual papers during their Diploma Course.

Note: The candidates who have completed their Diploma Course through Distance Education modes are not eligible to seek admission through Lateral Entry mode.

Shorter intrinsic training programmes of duration few weeks to a month or so will be conducted by the departments under the Supervision of the concerned HOD / Dean / Principal.

POLICY ON CHANGE OF NAME/DATE OF BIRTH

The name and date of birth of candidates will be registered in the records of the University as given in their H.S.C. Mark Statement/Transfer Certificate only. No request will be considered later, to correct the spelling of the name of the candidates.

The parents and candidates are requested to verify and confirm these entries in the H.S.C. Mark Statement / Transfer Certificate at the time of receipt of the same. Once admitted to a course of study in the University, date of birth as furnished in the HSC/School record of student and submitted to the University at the time of admission, shall be taken as final proof and no subsequent request for change of date of birth will be entertained by the University at any time under any circumstance, either during the course of study or after the completion of such study. The student should take utmost care while entering their details in SBV GARUDA portal at the time of their registration. They are responsible for any data mismatch at later stage.

Every student shall give an undertaking to this effect duly countersigned by his/her parent or guardian at the time of admission.

PAYMENT OF TUITION AND OTHER FEES

Every student shall pay tuition fee and other fee, as prescribed by the University, within the due date notified. The fees are subject to revision as per rules of the University. All fees, once paid to the University, will not be refunded or adjusted for any other purpose under any circumstance.

RULES FOR DISCONTINUANCE FROM COURSE OF STUDY

Where any student applies for discontinuance, or without any application discontinues on his/her own, from the course to which he/she has been admitted to, for any reason, either after the cut-off date prescribed by the statutory authorities/ University for admission to the first year of the course concerned or where the seat is rendered vacant without having any chance of being filled up with any other candidate from waiting list etc., such students will have to remit the tuition fee and other applicable fees for the **'Entire/Remaining Course Period'**. Unless and until payment of all the prescribed fees for the entire/remaining course period is made to the University account, such student shall not be entitled to any certificate including transfer certificate, mark sheets etc., to be issued by the College/ University and to get back his/her original certificates deposited with the University at the time of admission. All students and parent will be required to furnish a declaration agreeing to the above said conditions at the time of admission.

POLICY ON RAGGING

Ragging is strictly prohibited in the University Campus. Sri Balaji Vidyapeeth strictly enforces anti-ragging measures and the campus is free from any form of ragging. Any violation will be dealt with according to the law in force and as per directives of the Supreme Court of India. The University has adopted the ―Medical Council of India (Prevention and Prohibition of ragging in Medical College / Institutions) Regulations, 2009 and ―UGC Regulations on curbing the menace of Ragging in Higher Educational

Institutions, 2009 and these Regulations shall be applicable to all students. These Regulations are available in the University Website.

IMPORTANT NOTE

All admissions are subject to fulfillment of all the prescribed eligibility conditions by the candidate. If it is found either at the time of admission or at a later stage, that the candidate has given false information/forged certificates or concealed material information, his/her admission shall be cancelled and the student shall be dismissed from the college immediately.

The University reserves the right to change the curriculum, course structure and the rules relating to admission, examinations, fee structure, refunds, etc.

All disputes arising in the interpretation and implementation of the provisions will be referred to the Vice-Chancellor of Sri Balaji Vidyapeeth and Vice-Chancellor's decision shall be final and binding.

In respect of matters relating to or arising out of this prospectus the jurisdiction shall lie in Puducherry alone.

FUTURE PLANS

It is planned to conduct an informal market survey and start AHS Certificate & M.Sc courses.

OUTLINE OF THE CHOICE BASED CREDIT SYSTEM (CBCS) FOR UNDERGRADUATE DEGREE PROGRAMME

Credit System Credit System (CBCS): The CBCS provides choice for students to select from the prescribed courses (core, elective or minor or soft skill courses).This is to enhance the quality and mobility of the students within and between the Universities in the country and abroad.

Credit hours
16 Theory classes = 1 credit
32 Practical/Tutorial/Clinical training/Research project = 1 credit

Subjects	Credits
Each core subjects	6 Credits
Ability Enhancement Compulsory course (AECC)	2 Credits
Skill Enhancement course (SEC)	2 Credits
Generic Elective course (GE)	4 Credits
Discipline Electives (DE)	4 Credits

Core course: A Hard core course may be a Theory, Practical (lab), clinical rotation/field work or Research Project Work which are compulsory component studied by candidate to complete the requirement of their programme.

Discipline Elective (DE) Course: An elective course which is supportive or related to the discipline/subject (i.e. supportive to core course) is called a Discipline Elective (DSE) Course.

Generic Elective (GE) Course: An elective course which is unrelated to the discipline/subject (i.e. unrelated to core course) to expand their knowledge chosen by a candidate is called a Generic Elective.

Skill Enhancement Courses (SEC): This course chosen by candidate which provides additional value-based and skill-based knowledge to increase their employability.
NPTEL/ SWAYAM / MOOC/ Other value-added online courses

COLLEGES	PROGRAMMES WHICH INVOLVE CREDIT TRANSFER
Mahatma Gandhi Medical College and Research Institute & Shri Sathya Sai Medical College and Research Institute	B. Sc. (AHS)

Each Undergraduate student of B.Sc (AHS) is recommended to earn a minimum of **EIGHT credits** from the online courses offered through SWAYAM - NPTEL – MOOCs platform during their Course period. It is to be noted that the student earns the credit prior to the starting of their internship.

PROGRAMME	DESIRABLE CREDITS	NUMBER OF COURSES
B.Sc. (AHS)	Minimum - 8 credits	Minimum - 4 Maximum - 6

It is required of the Undergraduate students (B.Sc – AHS) that in addition to their curricular requirement of the programme, it is recommended for enhancing job opportunities for the student to earn minimum of prescribed credits from the online courses offered through SWAYAN - NPTEL – MOOCs platform that will be transferred
into the students' Statement of Marks, issued during the final year of their study. This has to be completed prior to the starting of their internship programme and students have to be informed that **those who do not earn the minimum credits prescribed by SBV, it will be mentioned NIL for the details on credits transferred from ONLINE courses in their FINAL year statement of marks issued by SBV.**

Credit points during Internship

For the 16 UG Internship programmes, there is a Minimum of 40 Credit points to a maximum of 45 Credit points which the students have to obtain. Credit points will be assessed based on the student's satisfactory attendance, performance in the Clinical /Camp postings / Seminars /Presentation of the logbook & Research project.

CRITERIA FOR UNIVERSITY EXAMINATIONS

Eligibility / Maximum Duration for the Award of the Degree

a) The candidates shall be eligible for the bachelor degree when they have undergone the prescribed course of study for a period of not less than four years (3 Years + 1 Year Internship) in an institution approved by the university and have passed the prescribed examination in all subjects.

b) A student who does not meet the minimum attendance requirement in a year must compensate the inadequacies before appearing examination.

To reaffirm the passing minimum in the University Examinations for all the Undergraduate courses offered under the Faculty of Allied Health Sciences.

- A candidate shall secure a minimum of 50% aggregate in University Core theory/ Elective theory Exams and Internal Assessment put together.
- A candidate shall secure a minimum of 50% aggregate in University Practical and Internal Assessment put together.
- For Skill based electives, a candidate shall secure a minimum of 50% aggregate in University Practical cum Viva Exams and Internal Assessment put together.

Retotaling / Revaluation and Grace Mark

There is no provision for **Retotaling / Revaluation for AHS programme.**

Grace marks up to a maximum of five marks may be awarded at the discretion of the university to a student who has failed and shall be distributed among the failed subjects.

SCHEME OF EXAMINATION

1) **Attendance Requirements**: 80% hours of learning in each Core Subjects / Electives / Practical's /Postings for appearing for the university exams.
2) **Minimum marks required to be eligible for University Examination**: 35% marks in the internal assessment (Theory / Practical) are required for the candidate to be eligible to appear in the University Examinations.
3) **Passing Minimum**: 50% aggregate both in theory and practical's including internal assessment marks is required for a candidate to pass in the University Examinations.
4) **Submission of Record Note Books for practical examinations**

Candidates appearing for practical examinations should submit bonafide Record Note Books prescribed for practical examinations, otherwise the candidates shall not be permitted to appear for the practical examinations.

GRADING

Marks obtained by candidate	Equivalent grade letter	Grade descriptor	Grade point
85 % & above	O	Outstanding	10
75-84	A+	Excellent	9
65-74	A	Very good	8
60-64	B+	Good	7
55-59	B	Above average	6
50-54	C	Average pass	5
49 & below	F	Reappear	0
	AB	Absent	0

A student obtaining **Grade F** shall be considered failed and will be required to reappear in the examination.

Conversion formula for Percentage to CGPA
Percentage divided by 9.5 = CGPA

Award of Class

Class division will be based on CGPA grade

≥ 7.8 grade point = Distinction Division
≥ 6.8 and < 7.7 grade point = First class Division
≥ 6.3 and < 6.7 grade point = Second class Division
≥ 5.2 and < 6.2 grade point = Third class Division
< 5.2 and below – Fail

Computation of SGPA and CGPA will be in accordance with the UGC Guidelines & Recommendations. It is a measure of overall cumulative performance of a student over all exams. The CGPA is the ratio of total credit points secured by a student in various courses in all exams and the sum of the total credits of all courses in all the University exams. It is expressed up to two decimal places.

Cumulative Grade Point Average (CGPA): It is a measure of overall cumulative performance of a student over all exams. The CGPA is the ratio of total credit points secured by a student in various courses in all exams and the sum of the total credits of all courses in all the University exams. It is expressed up to two decimal places.

Grade Point: It is a numerical weight allotted to each letter grade on a 10-point scale.

Transcript: Based on the credits earned, a transcript shall be issued to all the registered students after the completion of the program indicating the hours of study and structure of the curriculum delivery as prescribed in his/her curriculum and completed by the student. The transcript will display the course details, including course code, title, and number of credits, hours and type of contact hours in a semester.

INTERNAL ASSESSMENT

1. Continuous Internal Assessment (CIA) for all AHS programs with a minimum of 4 Assessments per year.
2. Internal Assessment will be done in each subject according to the scheme of examinations. The IA marks will be on the basis of performance in the assignment, class tests and practical test in the clinical areas.

Evaluation of Clinical Rotation

Lab, Clinical cum Community postings - To conduct practical's or viva based on the Heads of the concerned department's decision and the total 100 marks to be sent to COE through proper channel to find a place in the transcript.

Question Paper Pattern

The following question paper patterns shall be followed for CBCS pattern syllabi for the candidates admitted from the academic year 2019-20 onwards.

CORE SUBJECTS

For **UG NON-SEMESTER COURSES -** Each Core Subjects University Exam carries -100 marks of 80(Theory) + 20 (IA marks) which consists of

Theory – 80 marks			
I	Essay-type questions of either / or type -(like 1.a (or) 1.b)	2 (of either / or type)	2 x 10=20
II	Short answer questions	6 (*1 choice)	5 x 6=30
II	Very Short answer questions	12 (*2 choice)	10 x 3=30

The University duration of 80 marks – 3 Hours For courses having Section A & Section B Subjects

For **Section A & Section B** Subjects University Exam carries - 50 marks for each Section consisting of 40 (Theory marks) + 10 (IA marks)

Theory – 40 marks			
I	Essay-type questions of either / or type -(like 1.a (or) 1.b)	1 (of either / or type)	1 x 10 = 10
II	Short answer questions	5 (*2 choice)	3 x 6= 18
II	Very Short answer questions	5 (*1 choice)	4 x 3 = 12

ELECTIVE SUBJECTS

For all UG NON SEMESTER **COMPULSORY, GENERIC & DISCIPLINE** Elective University Exam papers carries- 50 marks of 40 (Theory)+10 (IA marks) which consists of

Theory – 40 marks			
I	Short answer questions	5 (*3 choice)	5 x 6=30
II	Very Short answer questions	5 (*2 choice)	5 x 2=10

*** Number of choices given**

- For **SKILL BASED ELECTIVES** from 2019-20 batch onwards all UG AHS courses will have 40 marks as university Practical cum Viva examination & 10 marks as Internal Assessment = 50 marks.
- 50 marks of the **COMPULSORY, GENERIC, DISCIPLINE & SKILL BASED ELECITIVES** which will be converted to 100 marks in the transcript.

CONDONATION FOR SHORTAGE OF ATTENDANCE

Condonation of shortage of attendance in aggregate up to 10% in each Year may be granted by the college Academic Committee and as per regulations of university.

ANALYSIS OF PROGRAMME OUTCOME AND COURSE OUTCOME OF B.Sc. OPTOMETRY

FACULTY OF ALLIED HEALTH SCIENCES

CHOICE BASED CREDIT SYSTEM (CBCS)

2019 -2020 ONWARDS

PROGRAM OUTCOME AND COURSE OUTCOME ANALYSIS

INTRODUCTION

Quality assurance is a key factor in education. This requires analysis of Program Outcome (PO) and Course Outcome (CO) mapping. This analysis is an important step in outcome based education. Faculty of Allied Health Sciences education is moving from traditional teaching learning process to innovative method of teaching and learning, this need to be incorporated in to the evaluation system. Besides analyzing the mapping, to make it more objective a score need to be obtained for mapping and attainment score need to be calculated for each course and program. All these analysis help to monitor not only the performance of the program but also the individual students. This type of analysis is not routine in health career education.

TERMINOLOGIES

Program educational objective (PEO)

Program Educational Objectives are broad statements that describe what graduates are expected to attain within few years of completing their program. These are based on the needs of the society as analyzed and outlined by the regulatory bodies.

Program Outcome (PO)

Program outcomes represent broad statements that incorporate many areas of inter- related knowledge and skills developed over the duration of the program through a wide range of courses and experiences. They represent the big picture, describe broad aspects of knowledge, skill and attitude development, and encompass multiple learning experiences.

Course Outcomes (CO)

Course outcomes describe the learning that will take place across the curriculum through concise statements, made in specific and measurable terms, of what students will know and/or be able to do as the result of having successfully completed a course.

Mapping of PEO, PO and CO

Mapping (program mapping) facilitates the alignment of course-level outcomes with program outcomes. It allows faculty to create a visual map of a program. It is also used to explore how students are meeting program-level outcomes at the course level. Outcomes mapping focuses on student learning also.

Attainment score or level

Attainment score or level is defined as a measure of a student‘s achievement in school which compares every child to a standardized expectation for their level, regardless of individual starting points.

Bloom's Taxonomy

Bloom's Taxonomy of Learning Domains was created in 1956 under the leadership of educational psychologist Dr. Benjamin Bloom in order to promote higher order of thinking in education. It is most often used when designing educational, training, and learning processes. The three Domains of Learning are (1) Cognitive: Mental Skills (Knowledge), (2) Affective: growth in feelings or emotional areas (attitude or self) and (3) Psychomotor: manual or physical skills (skills). **(Figure1)**

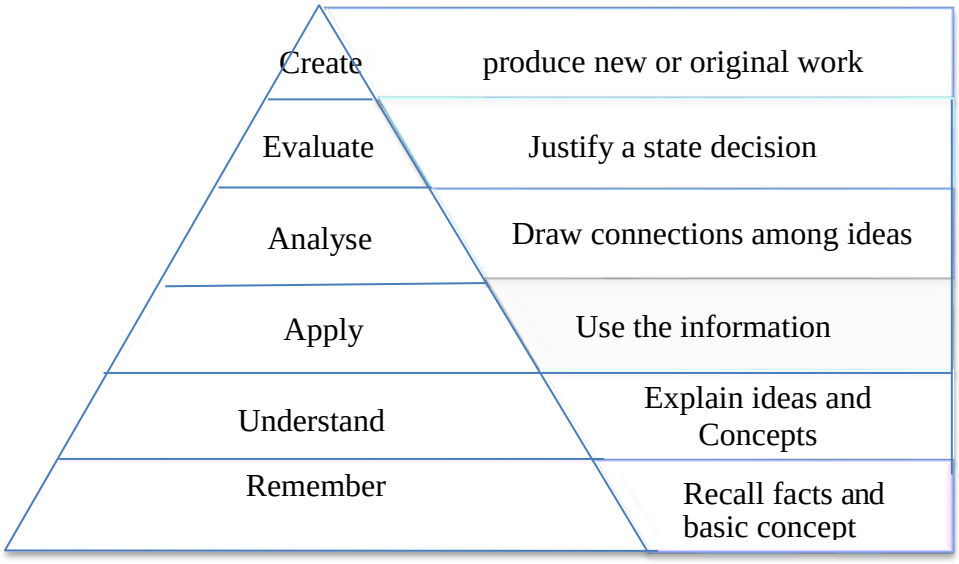

Figure1 Bloom's taxonomy

Faculty of Allied Health Sciences under Mahatma Gandhi Medical College and Research Institute, Sri Balaji Vidyapeeth University, a health sciences university of Puducherry. It has provided the syllabus for various health care courses, where all courses have its own objectives and methodology to achieve the course outcomes. To attain the course outcomes and program outcome, the institutes use course wise marks of students and the pass percentage of the summative.

PROGRAM EDUCATIONAL OBJECTIVES (PEO)

Program educational objectives for under graduate program are as follows:

- A technical expert who genuinely gets involved in patient care and does multi-task responsibilities.
- Communicators possessing adequate communication skills to convey the required information in an appropriate manner in various health care settings.
- Demonstrate basic administration/management and leadership skills.
- Lifelong learner is keen on updating oneself regarding the technical advancement in the health care field and able to perform the role of a good technologist and /or, researcher and teacher.
- Optometrist who understands and follows the principle of bio-ethics / ethics related to the health care system.

PROGRAM OUTCOME (PO)

At the end of the 3 year of training under graduates of Optometry Should be able to

OPT -PO1: Performs the duty as a optometrist, with leadership qualities having a good written & communication skills and also skilled at computer applications including E-Library.

OPT -PO2: To gain knowledge about laboratory safety precautions, biomedical waste management adhering to the environmental needs of the society, and preventing the spread of infectious diseases.

OPT PO 3: Understanding the structure and functions of different organs in normal human body

OPT PO 4: To learn the general Biochemistry, Microbiology and Pathology, gaining expertise in Clinical Laboratory practices.

OPT PO 5: Be able to correct refractive errors and provide spectacle prescription

OPT PO 6: Be able to fit, evaluate, prescribe and dispense contact lenses for refractive errors and other ocular conditions

OPT PO 7: Be able to assess the low vision and provide comprehensive low vision care

OPT PO 8: Be able to have adequate knowledge to develop skill in manufacturing of spectacles, contact lenses and low vision devices.

OPT PO 9: Be able to do complete binocular vision assessment, manage non-strabismic Binocular vision anomalies and refer condition which warrants surgery

OPT PO 10: Be able to assess the visual demands for various occupations and match it to the visual capabilities. Also be able to advice on eye safety wear for various occupations.

OPTPO 11: Have knowledge and skill for early detection of various ocular conditions such as glaucoma and its pharmacological treatment.

OPT PO 12: Have knowledge regarding organizations of eye banks and preservation of ocular tissues.

OPT PO 13: Have knowledge on sensory substitution and other rehabilitation measures for totally visually challenged. To identify various life style disorders and with due counselling & guidance advising the patients with proper diet, hygiene and Yoga to keep the body, mind, soul and behavior healthy

COURSE (CS)

B.Sc. Optometry (OPT) program under the CHOICE BASED CREDIT SYSTEM consists of following core courses namely: 1st Year B.Sc OPT consists of Anatomy, Physiology, Biochemistry, Pathology, and Microbiology ; 2nd Year B.Sc OPT consists of, Computer Application, Environmental Sciences, Physical and geometrical optics, Ocular Diseases, Optometric Optics & Visual optics and Instrumentation;3rd YearB.ScOPTconsistofBSVandcontactlens,Glaucoma ,Dispensing Optics and Low vision Aids & Pediatric, Geriatric, Law and Occupational Optometry; 4th Year – One year Internship. Also a**s per the UGC guidelines, during the study period an Allied Health Science Student will be studying Two Ability Enhancement compulsory courses, four Skill enhancement courses, two Generic Elective Courses and two Discipline Elective Courses.** Thus the B.Sc Optometry (OPT) program consists of following Electives courses, namely **Ability Enhancement compulsory course (AECC) consisting** of English and Environmental studies, **Skill enhancement courses namely** Culinary Skills for optimal nutrition, Enhancing soft skill & personality, Basics of Yoga & Practice, Speaking effectively, Good Clinical Laboratory practice, Computer Applications, Library and E-resource and Public Health and Hygiene, **Generic Elective Course** namely Basics of Hospital Administration, Counseling and Guidance, Lifestyle Disorders, Basic Psychology, Sociology and Entrepreneurship essentials, **Discipline Elective Courses namely** Biomedical Waste Management, Eye banking ,Community Optometry, Ocular Pharmacology &Visual diagnostics. Each course has its well defined course outcome mentioned in individual course book.

Mapping and analysis of Cs, POs and PEOs

The process of attainment of Cs, POs and PEOs starts from writing appropriate COs for each course in the three year plus one year internship degree program. As Undergraduate Allied Health Science program is Non-regulatory, COs and POs are defined by SBV norms. Based on this, course outcomes are refined by the respective faculty members of the course using action verbs of learning levels as suggested by Bloom Taxonomy. Then, a correlation is established between Cs and POs and Cs and PEOs on the scale of 0 to 3 (‘0‘being no correlation, 1 being the low correlation, 2 being medium correlation and 3 being high correlation) based on their perception. The average score is calculated and is correlated with the courses as a whole not individually. The core paper & Elective course 34 x 5 mapping matrix of COs-PEOs **(Table.1)** The core paper & Elective course of 34 x 13 mapping matrix of Cs-POs **(Table. 1)** is prepared at the institute level in this regard for all courses in the program. Radar graph was plotted to find out the level of correlation between PEO-Cs **(Fig.1)** and PO-Cs**(Fig.2**).

TABLE 1. CO-PEO MAPPING MATRIX

S.NO	COURSE	PEO1	PEO2	PEO3	PEO4	PEO5
1.	Anatomy(AN)	3	2	1	3	3
2.	Physiology(PHY)	2	3	2	3	3
3.	Biochemistry(BIO)	3	2	3	3	3
4.	Pathology(PAT)	3	3	3	3	3
5.	Microbiology(MIC)	3	3	3	3	3
6.	English(ENG)	2	3	2	2	2
7.	Culinary Skills for optimal nutrition (NUTRI)	3	2	1	3	3
8.	Enhancing soft skill & personality(ESSP)	3	2	1	2	3
9.	Basics of Yoga & Practice	3	1	2	2	3
10.	Speaking effectively	2	3	2	3	3
11.	Basics of Hospital Administration(HOSP)	3	2	2	3	2
12.	Counseling and Guidance(COUNS)	2	3	1	3	2
13.	Lifestyle Disorders (LD)	2	3	2	3	2
14.	Physical and geometrical optics	3	2	2	3	3
15.	Ocular Diseases	3	2	2	3	3
16.	Optometric Optics	3	2	2	3	3
17.	Visual optics and Instrumentation	3	1	2	3	3
18.	Environmental studies	2	3	2	3	3
19.	Good Clinical Laboratory practice	3	3	3	2	3
20.	Computer Applications	3	2	1	3	2
21.	Library and E-resource	3	2	2	3	2
22.	Public Health and Hygiene	2	2	3	2	3
23.	Basic Psychology	3	2	2	3	3
24.	Sociology	2	3	3	3	2
25.	Entrepreneurship essentials	3	2	2	3	3
26.	BSV and contact lens	3	1	1	2	3

27.	Glaucoma	3	1	2	2	3
28.	Dispensing Optics and Low vision Aids	3	2	2	3	3
29.	Pediatric, Geriatric, Law and Occupational Optometry	3	3	2	2	2
30.	Biomedical Waste Management	3	3	2	3	3
31.	Eye banking	3	2	3	1	3
32.	Community Optometry	3	2	2	2	3
33.	Ocular Pharmacology	3	2	2	3	3
34.	Visual diagnostics	2	2	3	2	3
AVERAGE SCORE		**2.74**	**2.24**	**2.06**	**2.65**	**2.76**

CO- PEO MAPPING

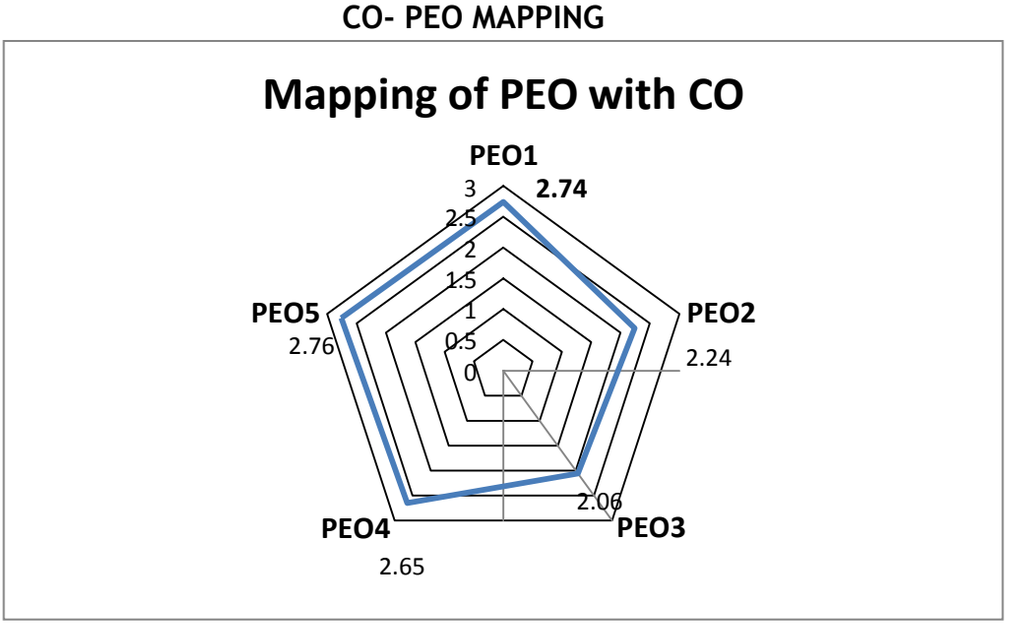

Figure 1. Mapping of Program educational objectives& course (0 - no correlation; 1 - Low correlation; 2 - Medium correlation ; 3 - High correlation

TABLE 2. CS-PO MAPPING MATRIX

S.NO	COURSE	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	P012	P013
1.	Anatomy(AN)	3	2	3	2	2	0	1	1	1	2	2	1	3
2.	Physiology(PHY)	3	3	3	3	2	0	3	2	2	1	2	2	2
3.	Biochemistry(BIO)	3	2	2	3	3	3	3	2	2	3	2	2	3
4.	Pathology(PAT)	3	3	2	3	3	3	2	3	2	3	2	2	1
5.	Microbiology(MIC)	3	3	2	3	3	3	2	3	2	3	2	2	2
6.	English(ENG)	2	2	1	1	0	1	0	0	2	1	2	2	3
7.	Culinary Skills for optimal nutrition(NUTRI)	2	2	1	0	0	3	0	1	2	0	1	1	2
8.	Enhancing soft skill & personality(ESSP)	2	2	2	2	1	0	2	1	2	2	2	3	3
9.	Basics of Yoga & Practice	3	2	1	1	0	1	0	0	2	1	2	2	3
10.	Speaking effectively	2	2	1	2	0	3	2	1	2	2	1	1	2
11.	Basics of Hospital Administration (HOSP)	3	2	2	2	1	0	2	1	2	2	2	3	2
12.	Counseling and Guidance(COUNS)	3	2	2	2	0	1	1	2	2	1	2	2	3
13.	Lifestyle Disorders (LD)	3	2	2	1	2	3	0	1	2	0	1	1	2
14.	Physical and geometrical optics	2	2	2	2	1	0	2	1	2	2	2	3	3
15.	Ocular Diseases	3	3	2	3	3	3	3	3	1	3	2	3	2

16.	Optometric Optics	3	2	3	3	3	3	3	3	3	2	3	3	3
17.	Visual optics													2
18.	Environmental studies	3	2	1	1	2	3	1	1	2	2	1	3	3
19.	Good Clinical Laboratory practice	2	2	3	2	1	1	2	1	3	2	2	3	2
20.	Computer Applications	3	3	2	2	3	3	3	3	1	3	2	3	3
21.	Library and E-resource	3	2	3	2	2	3	2	1	2	0	1	1	1
22.	Public Health and Hygiene	3	2	1	1	2	3	1	1	2	2	1	3	2
23.	Basic Psychology	2	2	3	2	1	1	2	1	3	2	2	3	1
24.	Sociology	3	2	2	2	3	3	3	3	1	3	2	3	23
25.	Entrepreneurship essentials	3	2	3	2	2	3	2	1	2	2	1	3	2
26.	BSV and contact lens	3	2	1	2	2	3	1	2	3	2	2	3	1
27.	Glaucoma	3	2	3	2	2	3	2	3	3	2	3	3	2
28.	Dispensing Optics and Low vision Aids	3	3	2	2	3	3	3	3	2	3	2	3	3
29.	Pediatric,Geriatric,Law and Occupational Optometry	3	2	1	2	2	3	2	1	2	0	1	1	1
30.	Biomedical Waste Management	3	2	1	2	2	3	1	2	2	2	1	3	2

31.	Eye Bank	3	2	3	2	1	2	2	1	3	2	2	3	2
32.	Visual Diagnostics	3	2	2	2	3	2	3	3	1	3	2	3	3
33.	Pharmacology	3	2	2	2	3	2	3	3	1	3	2	3	1
AVERAGE SCORE		**2.90**	**2.09**	**2.12**	**1.81**	**1.84**	**2.06**	**1.96**	**1.81**	**2.21**	**1.87**	**1.90**	**2.27**	**1.96**

(0 - No correlation; 1 - Low correlation; 2 - Medium correlation ;3 - High correlation).

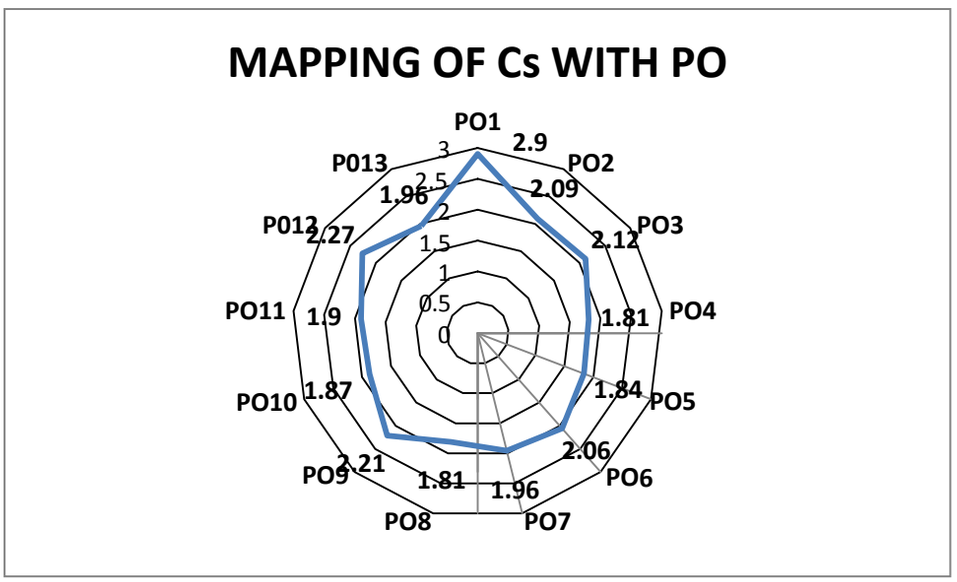

Figure 2. Mapping of Program outcome & course
(0 - No correlation; 1 - Low correlation; 2 - Medium correlation; 3 - High correlation)

ANALYSIS OF COS, POS AND PEOS

On analyzing, the average score of individual program outcome ranges from 1.81 to 2.90. It shows, there exist a strong correlation of all Cos with that of PO1 & PO12, whereas medium correlation between Cos and PO4 to PO 5. Similarly, on analyzing, the average score of individual program educational objectives ranges from 2.0 to 2.75. It shows, there exist a strong correlation of all Cs with that of PEO1 & PEO5, whereas medium correlation between Cs and PEO2, PEO3 & PEO4.

I YEAR

FACULTY OF ALLIED HEALTH SCIENCES

SRI BALAJI VIDYAPEETH

(Deemed to be University)

Accredited by NAAC with 'A' Grade

COMMON SYLLABUS FOR ALL FIRST YEAR B.Sc. ALLIED HEALTH SCIENCES

CORE SUBJECTS

1. Anatomy
2. Physiology
3. Biochemistry
4. Pathology & Microbiology

ELECTIVES

Ability Enhancement compulsory course (AECC)

1. English

Skill enhancement course (SEC) – Choose any TWO

1. Culinary Skills for optimal nutrition
2. Enhancing soft skill & personality
3. Basics of Yoga & Practice
4. Speaking effectively

Generic Elective Course (GEC) – Choose any ONE

1. Basics of Hospital Administration
2. Counseling and Guidance
3. Lifestyle Disorders

SCHEME OF CREDIT BASED ACADEMIC CURRICULUM

Faculty Code	Category	Course Title	Hours					Credits				
AHS	**Core theory CCT**	**Subjects**	**Theory**	**Practical**	**Tutorials**	**Lab training**	**Total hours**	**Lecture (L)**	**Practical**	**Tutorials**	**Lab training**	**Credits**
AHS	CCT-1	Anatomy	80		32			5		1		6
AHS	CCT-2	Physiology	80		32			5		1		6
AHS	CCT-3	Biochemistry	80		32			5		1		6
AHS	CCT-4	Pathology	40		16			5		1		6
AHS		Microbiology	40		16							
AHS	Lab training CCT 1 to 4					192					6	6
AHS	AECC	English	16	34				1	1			2
AHS	SEC – 1-3	Student‘s choice	16	32				1	1			2
AHS	SEC – 1-3	Student‘s choice	16	32				1	1			2
AHS	GEC 1-3	Student‘s choice	64					4				4
			432	**98**	**128**	**192**	**850**	**27**	**3**	**4**	**6**	**40**

SCHEME OF EXAMINATION AHS - I YEAR BASIC SCIENCES

Papers	Subject	Theory		Practical		Theory	Practical	Grand Total (700)	Min marks to pass % (350)
		UE	IA	UE	IA	UIA*	UIA*		
CCT-1	Anatomy	80	20					100	50
CCT-2	Physiology	80	20					100	50
CCT-3	Biochemistry	80	20					100	50
CCT-4	Pathology	40	10					100	50
	Microbiology	40	10						
CCT -LT	Lab training Core 1 to 4						100	100	50
AECC	Ability enhancement Compulsory Course- English	80	20					100	50
SEC	Skill enhancement Course	80	20					100	50
SEC	Skill enhancement Course	80	20					100	50
GEC	Generic elective	80	20					100	50

***UIA - University Internal Assessment only for Lab Trainings (No Final University Examination).**

Passing criteria -50 % aggregate both in theory and practical's including internal assessment marks

For all elective course, 40 marks for university theory and Practical cum Viva examination & 10 marks as Internal Assessment = 50 marks which will be converted to 100 marks in the transcript

ANATOMY

SYLLABUS FOR I YEAR
B.Sc. ALLIED HEALTH SCIENCES – ANATOMY

NAME OF THE SUBJECT PAPER	**: ANATOMY**
DURATION OF THEORY CLASSES	**: 80 Hrs**
DURATION OF TUTORIAL SESSIONS	**: 32 Hrs**
DURATION OF LAB TRAINING	**: 40 Hrs**
EXAMINATION	**: 100 Marks (80 U + 20IA)**
NO UNIVERSITY PRACTICAL EXAMINATION	
DURATION OF THEORY EXAMINATION	**: 3 Hrs**
YEAR IN WHICH THE SUBJECT PAPER IS TAUGHT	**: I YEAR**

COURSE DESCRIPTION

The course is designed to assist students to acquire knowledge of the normal structure of human body and its functions. To ensure that the students understand the alteration in anatomical structure and function in disease in the practice of accident and emergency care technology.

OBJECTIVES

At the end of the course, the student will be able to

1. Describe the anatomical terms, organization of human body and structure of cell, tissue, membranes and glands.
2. Describe the structure and functions of bones and joints.
3. Describe the structure and functions of systems in body. Have knowledge about Applied Anatomy

COURSE OUTCOMES FOR ANATOMY

At the end of the course, students will be able to...

AN-AHS-CO1: Explains the Gross and Microscopic structure of human body.

AN-AHS-CO2: Explains the normal structure and integration of the functions of the organs and systems on basis of the structure of Human body.

AN-AHS-CO3: Explains the clinical correlation of the organs and structures involved and interprets the anatomical basis of the disease presentations.

AN-AHS-CO4: Knows about the General development of human body.

AN-AHS-CO5: Outlines the knowing of the hard & soft structures of the body.

UNIT	TITLE	THEORY + TUTORIALS (80 + 32)HOURS
I	**(a) INTRODUCTION TO HUMAN BODY AS A WHOLE** • Terms of location, positions and planes • Cell and its organelles • Epithelium – Definition, classification, description with examples and functions. • Glands–Classification, description of Serous and Mucous glands with examples. • Basic tissues – Classification with examples. **(b) LOCOMOTION AND SUPPORT** • Cartilage – Different types with examples and Histology. • Bone – Classification, Names of bone cells, parts of Long bone, Microscopy of Compact bone, Names of all bones, Vertebral column, Intervertebral disc, Fontanelles of Fetal Skull. • Joints–Classification of Joints with examples, Synovial Joints (in detail for Medical Imaging Technology students) • Muscular system: Classification of Muscular tissue and histology. • Names of the muscles of the body.	20 + 8
II	**UNIT (a) CARDIO VASCULAR SYSTEM** • Heart Size, Location, Chambers – Exterior & Interior – conducting System and Valves • Blood supply of heart • Systemic & Pulmonary circulation • Branches of Aorta, Common Carotid artery, Subclavian artery, Axillary artery, Brachial artery, Superficial Palmar arch, Femoral artery and Internal Iliac artery. • Peripheral pulse • Inferior Venacava, Portal vein and Porto systemic anastomosis. • Great Saphenous vein • Dural Venous Sinuses • Lymphatic System – Cisterna Chyli and Thoracic duct. • Names of regionally mphatics, axillary and inguinal Lymph nodes in brief. **(b) RESPIRATORYSYSTEM** • Parts of Respiratory System, Nose, Nasal Cavity, Larynx, Trachea, Lungs, Broncho pulmonary segments • Histology of Trachea, Lung and Pleura • Names of Para nasal air sinuses	20 + 5
III	**(a) GASTRO- INTESTINAL SYSTEM – (10 +5hrs)** • Parts of GIT, Oral cavity (Tongue, Tonsil, Dentition, Pharynx, Salivary glands, Waldeyer‘s ring) • Oesophagus, Stomach, Small & Large Intestine, Liver, Gall Bladder, Pancreas **(b) URINARY SYSTEM - – (5hrs)** • Kidney, Ureter, Urinary bladder, Male & Female Urethra	10 + 5

IV	**(a) REPRODUCTIVE SYSTEM – (10 +2hrs)** • Parts of Male Reproductive system, Testis, Vas deferens, Epididymis, Prostate • Parts of Female Reproductive System, Uterus, Fallopian tubes, Ovary • Mammary gland **(b) ENDOCRINE GLANDS - (5hrs)** • Names of all Endocrine glands in detail on Pituitary Gland, Thyroid Gland, Parathyroid gland and Suprarenal Gland.	10 + 5
V	**NERVOUS SYSTEM – (15 +2 hrs)** • Cerebrum, Cerebellum, Mid brain, Pons, Medulla Oblongata, Spinal cord with spinal nerve • Meninges, Ventricles and Cerebrospinal fluid • Names of Basal nuclei • Blood Supply of Brain • Cranial Nerves	10 + 5
VI	**(a) EMBRYOLOGY** • Spermatogenesis and Oogenesis • Ovulation, Fertilization • Fetal Circulation • Placenta **(b) COURSE SPECIFIC TOPICS** • Skin • Eye • Arterial System and Venous Drainage System in detail	10 + 4

LAB TRAINING (40 hrs)

- Histology of Types of Epithelium
- Histology of Serous, Mucous and Mixed Salivary gland
- Histology of the types of Cartilage
- Demo of all bones showing parts, radiographs of normal bones & Joints
- Histology of Skeletal (TS & LS), Smooth and Cardiac muscle
- Demonstration of Heart and Vessels of the body
- Histology of Large artery, Medium sized artery and vein, Large Vein
- Microscopic appearance of Large and Medium sized Artery and Vein, Large Vein
- Demonstration of all muscles of the body
- Pericardium
- Histology of Lymph node, Spleen, Tonsil and Thymus
- Demonstration of parts of Respiratory system
- Normal Chest radiograph showing Heart shadows
- Histology of Lung and Trachea
- Normal Angiograms
- Histology of Lymphatic tissues
- Radiographs of Abdomen – IVP, Retrograde cystogram
- Demonstration of parts of the Urinary system and Histology of Kidney,Ureter and Urinary bladder

- Demonstration of Male and Female Pelvis with organs in situ.
- Histology of Male and Female Reproductive organs
- Histology of Pituitary, Thyroid, parathyroid and Suprarenal glands
- Histology of peripheral nerve and optic nerve.
- Demo of all parts of brain

METHODS OF TEACHING

- Lecture cum discussion
- Demonstration
- Lab visit
- Practical work record

METHODS OF EVALUATION

- Written Test
- Laboratory observation Book
- Assignments
- Oral Presentations

REFERENCE BOOKS

- Cohen, Memmler: Structure & Function of Human Body, Lippincott Williams & Wilkins; Tenth edition(2012)
- Waugh: Ross & Wilson Anatomy & Physiology in health and illness Penguin Books Ltd(2010)
- Tortora: Anatomy & Physiology, John Wiley & Sons(2012)

B.Sc. ALLIED HEALTH SCIENCES – ANATOMY - BLUE PRINT

Unit No.	Unit	Weightage	Marks Allotted	Knowledge / Recall			Understanding			Application		
				LAQ	SAQ	VSAQ	LAQ	SAQ	VSAQ	LAQ	SAQ	VSAQ
1	I	14 %	12	…	1	1	---	---	1	---	---	---
2	II	20 %	16	1		1	1*		----	---	---	1
3	III	20 %	15	1*	1	1	--	1	----	---	---	1*
4	IV	20 %	16	--	--	1	1	1*	1*	---	----	1
5	V	14 %	12	---	1	---	---	--	1	---	---	1
6	VI	12 %	9	---	1	---	---	--	1	---	---	--

LONG ANSWER QUESTIONS

S.No	Unit wise	Type of Question	Question has to ask
1	CVS / Respiratory System / GIT	Knowledge / Understanding	2
2	Urinary system / Reproductive system / Endocrine system	Knowledge / Understanding	2

SHORT ANSWER QUESTIONS

S. No	Unit wise	Type of Question	Question has to ask
1	Unit - I	Recall	1
2	Unit - II	Understanding	-
3	Unit – III	Understanding + Recall	2
4	Unit – IV	Understanding / Recall	1
5	Unit – V	Understanding	1
6	Unit – VI	Understanding / Recall	1

VERY SHORT ANSWER QUESTIONS

S.No	Unit wise	Type of Question	Question has to ask
1	Unit – I	Understanding / Recall	2
2	Unit – II	Understanding + Recall	2
3	Unit – III	Understanding + Recall + Application	2
4	Unit – IV	Understanding + Recall + Application	3
5	Unit – V	Understanding + Application	2
6	Unit – VI	Understanding / Application	1

The duration of Examination (University) is Three (3) hours.

The total marks for the University Examination will be 100 marks.

Long Answer Questions : 2 X 10 = 20 marks (Choice 2 out of4)

Short Answer Questions : 5 X 6 = 30 marks (Choice 5 out of 6)

Very Short Answer Questions : 10 X3 = 30 marks (Choice 10 out of 12)

TOTAL = Theory 80 + IA 20 = 100marks

MODEL QUESTION PAPER
FIRST YEAR B.Sc. ALLIED HEALTH SCIENCES
ANATOMY

Time:3 Hours **Maximum Marks:80**

Illustrate your answers with suitable diagrams where ever necessary.

LONG ANSWER QUESTIONS – (**Write any Two**) **(2 X 10 =20)**

1. (A) Explain the Gross features of Right atrium. **(OR)**
   (B) Explain the Gross features of Stomach.
2. (A) Explain the Gross features of Kidney. **(OR)**
   (B) Explain the Gross features of Thyroid gland.

SHORT ANSWER QUESTIONS - (Write any Five) **(5 x 6=30)**

1. Discuss the Classification of joints with its examples.
2. Discuss the boundaries and contents of superior Mediastinum.
3. Discuss the gross features of Right lung.
4. Discuss the external & internal features of 2nd part of Duodenum.
5. Discuss the location, external features of urinary bladder.
6. Discuss the supports of uterus.

VERY SHORT ANSWER QUESTIONS - (Write any Ten) **(10 x3 =30)**

1. Write a note on Sesamoid bone.
2. Trace the conducting system of Heart.
3. List out the paranasal air sinuses.
4. Write a note on Pancreatic duct.
5. List out the parts & functions of extra hepatic biliary apparatus.
6. Write a note on Trigone of urinary bladder.
7. Enumerate the Ovarian follicles.
8. Enumerate the hormones of Adrenal gland.
9. Enumerate the layers of Scrotum.
10. List out the meningeal layers & its modifications.
11. Structure of thin skin.
12. Write a note on Fertilization

PHYSIOLOGY

SYLLABUS FOR I YEAR
B.Sc. ALLIED HEALTH SCIENCES – PHYSIOLOGY

NAME OF THE SUBJECT PAPER	**: PHYSIOLOGY**
DURATION OF THEORY CLASSES	**: 80 Hrs**
DURATION OF TUTORIAL SESSIONS	**: 32 Hrs**
DURATION OF LAB TRAINING	**: 38 Hrs**
THEORY EXAMINATION	**: 100 Marks (80 U + 20IA)**
UNIVERSITY PRACTICAL EXAMINATION	**: NIL**
DURATION OF THEORY EXAMINATION	**: 3 Hrs**
YEAR IN WHICH THE SUBJECT PAPER IS TAUGHT	**: I YEAR**

COURSE DESCRIPTION

The course is designed to assist students to acquire the knowledge of the normal physiology of various human body systems and understand the alternation in physiology in disease and practice of accident and emergency care technology

COURSE OBJECTIVES

At the end of the course, the student will be able to

- Describe the physiology of cell, tissues, membranes and glands.
- Describe the physiology of blood and functions of heart.
- Demonstrate blood cell count, coagulation, grouping, Hb, BP and Pulse monitoring
- Describe the physiology and mechanism of respiration.
- Demonstrate Spirometry
- Describe the physiology of Excretory system

COURSE OUTCOMES FOR PHYSIOLOGY

At the end of the course, students will be able to...

PHY-AHS-CO1: Understand normal structure and functioning of the organs and organ systems of the body

PHY-AHS-CO2: Understand the regulatory mechanisms in normal and physiological variations.

PHY-AHS-CO3: Understand age-related physiological changes in the organ functions that reflect normal growth and development.

PHY-AHS-CO 4: Understand the physiological basis of diseases.

PHY-AHS- CO 5: Interpret laboratory data pertaining to normal function of organ and organ system.

UNIT	TITLE	THEORY + TUTORIALS (80+32) HOURS
I	**a. General physiology (5 + 2hrs)** • Structure and functions of cell and cell organelles • Transport across cell membrane • Homeostasis: definition and feedback mechanisms **b. Hematology (10 + 2hrs)** • Composition and function of blood and body fluids • Plasma proteins and their functions • RBC: morphology, production, functions and fate • Anemia: etiological & morphological classification • Immunity : Types, mechanism of immune response • Hemostasis and anticoagulants • Blood groups: Types, cross matching and clinical importance	15 +4
II	**Cardiovascular physiology (10 + 5 hrs)** • Functional anatomy • Conductive system of heart: origin, spread of cardiac impulse • Properties of cardiac muscle • ECG: leads, principles of normal recording. Normal waves and interpretations • Cardiac cycle • Heart sounds, Physiological basis of murmur • Cardiac output: definition, factors affecting, factors regulating and its measurement • Blood pressure: total pressure, lateral pressure, importance of different pressure, measurements, factors controlling BP • Shock: definition & types.	10 + 5
III	**Respiratory physiology (10 + 5 hrs)** • Functional anatomy • Mechanism of respiration • Lung volumes and capacities: definition, normalvalues, measurements and clinical importance • Transport of gases: oxygen and carbon dioxide • Control of respiration: neural and chemical regulation. • Dyspnoea, Asphyxia, cyanosis, periodic breathing • Hypoxia : definition and types	10 + 5
IV	**a. Gastro-intestinal physiology (5 hrs)** • GI secretions: saliva, gastric juice, pancreatic juice, liver & gallbladder • GI motility: deglutition, gastric motility and emptying,	15 + 3

	intestinal motility • GI hormones: Gerstein, Secretin, CCK – PZ, motilin, Inhibin **b. Renal physiology (10 + 3 hrs)** • Nephrons: structure, types and functions • Juxta glomerular apparatus • RBF: definition, normal values, factor affecting • GFR: definition, normal values factor affecting and factors regulating, measurement. • Renal handlings of solutes : Na+ , Cl- ,Glucose, water (diuretics, diuresis), H+, ammonia • Renin-angiotensin- aldosterone mechanism • Concentration of urine – countercurrent multiplier and countercurrent exchanger. • Micturition • Renal dialysis	
V	**a. Endocrine physiology (10 + 3hrs)** • Pituitary gland: hormones secreted and their functions, applied: dwarfism, gigantism, Diabetes Insipitus. • Thyroid gland: hormones secreted and their functions, applied: hypothyroidism, hyperthyroidism • Parathyroid gland: hormones secreted and their functions • Adrenal gland: hormones secreted and their functions • Pancreas: hormones secreted and their functions, applied: Diabetes Mellitus **b. Reproductive physiology (5 + 2hrs)** • Male reproductive system: spermatogenesis ,endocrine functions of testis • Female reproductive system: oogenesis, ovulation, functions of estrogen and progesterone. • Menstrual cycle: ovarian cycle, uterine cycle, hormonal changes, abnormalities of menstruation • Contraception	15 + 5
VI	**a. Nerve-Muscle physiology (5 + 5 hrs)** • Neurons: structure, types, properties, degeneration and regeneration • Neuromuscular junction: transmission of impulse and its clinical applications • Skeletal muscle: structure , muscle proteins, contraction& relaxation, types of contraction **b. Central nervous system (5 + 3hrs)** • Organization of nervous system • Synapse: types, functions • CSF :functions • Cerebral cortex: Broca`s area and their functions • Cerebellum: lobes & function • Basal ganglia: nucleus & functions, Parkinsonism	15 + 10

	• Hypothalamus: functions **c. Special senses (5 + 2 hrs)** • Vision: Errors of refraction, visual pathway and effects of lesion • Hearing: functions of middle ear, Conductive deafness and nerve deafness. • Smell and taste: receptors and pathways	

LAB TRAINING (38 hrs)

- Hemoglobinometry
- White Blood Cell Count
- Red Blood Cell Count
- Determination of Blood Groups
- Leishman's Staining and Differential WBC Count
- Determination of Packed Cell Volume
- Erythrocyte Sedimentation Rate(ESR)
- Determination of Clotting Time, Bleeding Time
- Recording of Blood pleasure
- Auscultation for Heart sounds
- Artificial Respiration
- Determination of Vital capacity.

METHODS OF TEACHING

- Lecture cum discussion
- Demonstration
- Lab visit
- Practical work record

METHODS OF EVALUATION

- Written Test
- Laboratory observation Book
- Assignments
- Oral Presentations

REFERENCE BOOKS

1. Basics of Medical Physiology D.Venkatesh /H.H.Sudhakar Wolters Kluwer Third Edition.
2. Waugh: Ross & Wilson Anatomy & Physiology in health and illness Penguin Books Ltd (2010).
3. Principles of Physiology, Singh (H).

PHYSIOLOGY - BLUEPRINT

Unit	Systems	Marks	Weightage (%)	Question type		
				LAQ (2 out of 4)	SAQ (5 out of 6)	VSAQ (10 out of 12)
I	General physiology	15	19%			2+1*
	Hematology			1*	1	1
II	Cardiovascular physiology	16	20%	1	1	
III	Respiratory physiology	16	20%	1	1	
IV	Gastro-intestinal physiology	12	15%		1	1+1*
	Renal physiology			1*		1
V	Endocrine physiology	12	15%		1	1
	Reproductive physiology					1
VI	Nerve-Muscle physiology	09	11%			1
	Central nervous system				1*	1
	Special senses					1
Note: * represents question of choice						

- The duration of Examination (University) is Three (3) hours.
- The total marks for the University Examination will be 100 marks.

Long Answer Questions : 2 X 10 = 20 marks (Choice 2 out of4)

Short Answer Questions : 5 X 6 = 30 marks (Choice 5 out of 6)

Very Short Answer Questions : 10 X3 = 30 marks (Choice 10 out of 12)

TOTAL = Theory 80 + IA 20 = 100 mark

MODEL QUESTION PAPER
FIRST YEAR B.Sc. ALLIED HEALTH SCIENCES
PHYSIOLOGY

Total marks: 80 **Duration: 3hours**

LONG QUESTION ANSWER **(2 X 10 =20)**

1. a) Define Erythropoiesis? Describe its stages. Mention the factors influencing it. **(OR)**

b) Define blood pressure. Write its normal range. Briefly explain short term regulation mechanism of blood pressure.

2. a) Explain how oxygen is transported in blood. Explain oxygen dissociation curve. List the factors shifting this curve to right & left**(OR)**

b) Define Glomerular filtration rate (GFR). Write its normal value. Explain the factors affecting it.

SHORT QUESTION ANSWER – Answer any 5 **(5 X 6 =30)**

1. Define hemostasis. Briefly explain blood clotting mechanism.
2. Define cardiac output. Give its normal value. Describe the factors regulating it
3. Draw normal spirogram indicating static lung volumes and capacities.
4. Briefly explain the mechanism of HCl secretion in stomach.
5. Name the anterior pituitary hormones. Briefly explain functions of growth hormones.
6. Briefly describe stages of Spermatogenesis.

VERY SHORT ANSWER – Answer any 10 **(10 X 3=30)**

1. Write the functions of Golgi apparatus
2. Briefly explain osmosis
3. Briefly describe the function of Na^+ K^+ ATPase pump
4. What are anticoagulants? Name any two.
5. Write any 3 functions of saliva
6. Name any two GI hormones. Write any one function of them.
7. Name the cells of Juxta glomerular apparatus & mention their function
8. List the 3 functions of thyroid hormone
9. Name natural contraceptive methods
10. Classify muscle proteins
11. Classify glial cell. Write any two functions of it.
12. What is myopia? How it is corrected

BIOCHEMISTRY

SYLLABUS FOR I YEAR
B.Sc. ALLIED HEALTH SCIENCES – BIOCHEMISTRY

NAME OF THESUBJECTPAPER	**: BIOCHEMISTRY**
DURATION OF THEORY CLASSES	**: 80hrs**
DURATION OF TUTORIAL SESSIONS	**: 32hrs**
DURATION OF LAB TRAINING	**: 38Hrs**
THEORY EXAMINATION	**: 100 marks (80 U + 20IA)**
UNIVERSITY PRACTICAL EXAMINATION	**: Nil**
DURATION OF THEORY EXAMINATION	**: 3 hrs**
YEAR IN WHICH THE SUBJECT PAPER IS TAUGHT	**: IYEAR**

COURSE DESCRIPTION

The course is designed to assist students to acquire the knowledge of the normal biochemical functioning of human body and alterations.

OBJECTIVES

At the end of the course, the student will be able to

1. Identify the basic principles of biochemistry.
2. Synthesize the knowledge of these principles in various situations.

COURSE OUTCOMES FOR BIOCHEMISTRY

At the end of the course, students will be able to...

BIO-AHS-CO1: Correlate the integration of various aspects of biomolecules and its lab diagnosis

BIO-AHS-CO2: Explain biochemical basis and rationale of clinical laboratory tests for inborn errors of metabolism, and interpret the results.

BIO-AHS-CO3: Correlate the results of these investigations with the primary disorders of each human body system.

BIO-AHS-CO4 Follow good clinical laboratory practice as well as to handle the biological samples collected

BIO-AHS-CO5: Learn how to collect the samples and to process it for diagnostic purposes

UNIT	TITLE	THEORY + TUTORIALS (80 +32) HOURS
I	**(i) INTRODUCTION TO BIOCHEMISTRY** • Biophysical aspects of Biochemistry: Theory of acids and bases, Ionization of acids, Dissociation of water, Hydrogen ion concentration and concept of pH, Dissociation of acids and bases, Basic concepts in Acidosis and Alkalosis (Respiratory and Metabolic) • Concept of buffering, Definition of buffers and Buffering Capacity, Chemical and Physiological buffers, Henderson Hassel Balch equation and pH – pK relationship, • Glass electrode and determination of pH, Acid Base titration. **ii) PROTEINS** • Proteins: Chemistry, Classification, properties and biomedical importance of Proteins. • Hydrolytic products of proteins • Classification of Amino acids and important properties **iii) ENZYMES** • Definitions of Catalyst, Enzymes, Apo enzyme, Coenzyme, Holoenzyme, Cofactors and prosthetic group • Active site • Systematic classification of Enzymes • Factors influencing Enzyme kinetics • Enzyme units	18 + 6
II	**i) CARBOHYDRATES** • Carbohydrates: Chemistry, Classification, properties and biomedical importance of carbohydrates. **ii) NUCLEOPROTEINS** • Purine and Pyrimidine bases • Ribose and Deoxy Ribose • Definition of Nucleosides and Nucleotides • Structure of DNA • Types of RNA • Biologically significant Nucleotides	15 + 5
III	**LIPIDS** • Definition of Fats and Oils • Classification of Lipids • Saturated and Unsaturated Fatty acids • Properties of Lipids • Biomedical importance of Lipids with special reference to Phospho Lipids, Glycolipids and Cholesterol.	15 + 7
IV	**ENGERY METABOLISM AND NUTRITIONAL BIOCHEMISTRY** • Calorific value, Respiratory Quotient, Resting Metabolic expenditure, Specific dynamic action • Energy requirements • Complex Carbohydrates and Role of Dietary fiber • Essential Fatty acids • Essential amino acids	20 + 6

	• Positive and Negative Nitrogen balance • Protein Energy Malnutrition • Biochemical functions of Vitamins • Biochemical functions of major and trace elements	
V	**(i) CLINICAL CHEMISTRY** • Serum Osmolality: Significance and measurement • Electrophoresis: Principles, Methodology and Diagnostic significance • Principles and applications of Patrician Chromatography • Simple tests to identify Carbohydrates, Lipids and Proteins in biological fluids • Qualitative estimation of Glucose, Proteins, Cholesterol, Urea, Creatinine and Uric acid and their diagnostic significance **(ii) ENVIRONMENTALCHEMISTRY** • Definition of Pollutants • Impact of Terrestrial, Water and air pollutants • Bio pesticides Chemistry, Metabolic Transformation in the living system and role in Chemical Pathology • Influence of Non-Biodegradable domestic utility items and its role in metabolic disorders • Carcinogens and mutagens: qualitative and molecular pathology involved in mutagenesis and carcinogenesis • Plastics and its impacts on Society • Biomedical Waste and its management	12 + 8

LAB TRAINING (38 hrs)

- Simple Color reactions of Carbohydrates and Proteins
- Qualitative estimations of Glucose, Urea, Creatinine, Total Protein and Cholesterol
- Normal constituents of Urine
- Abnormal(pathological)Urine
- Glucose Tolerance Test and its significance
- Demonstration of Electrophoresis and Interpretation of important clinical conditions based on Electrophoresis appearance
- Demonstration of Paper Chromatography and its utility in the diagnosis of inborn errors of metabolism

METHODS OF TEACHING

1. Lecture cum discussion
2. Demonstration
3. Lab visit
4. Practical work record

METHODS OF EVALUATION

1. Written Test
2. Laboratory observation Book
3. Assignments
4. Oral Presentations

REFERENCE BOOK

1. Essential of Biochemistry for B.Sc. Nursing Students Harbanslal, first edition.
2. Biochemistry U.Sathya Narayana, U.Chakrapani, fifth edition

B.Sc. ALLIED HEALTH SCIENCES – BIOCHEMISTRY (I Year) BLUE PRINT

Unit No.	Weightage	Marks Allotted	Knowledge/ Recall			Understanding			Application		
			LAQ (10)	SAQ (6)	VSAQ (3)	LAQ (10)	SAQ (6)	VSAQ (3)	LAQ (10)	SAQ (6)	VSAQ (3)
I	30 %	25		1	1	1	1				
II	20%	19	1		2			1			
III	15%	12	1*	1	2						
IV	15 %	9	1*	1*	2			1			
V	20%	15		1	1 + 1*		1	1*			

The duration of Examination (University) is Three (3) hours.
The total marks for the University Examination will be 80 marks.

Long Answer Questions : 2X 10 marks = 20 marks (Choice 2 out of 4)

Short Answer Questions : 5X 6 marks = 30 marks (Choice 5 out of 6)

Very Short Answer Questions : 10 X 3 marks = 30 marks (Choice 10 out of12)

TOTAL = Theory 80 + IA 20 =100marks

MODEL QUESTION PAPER
FIRST YEAR B.Sc. ALLIED HEALTH SCIENCES
BIOCHEMISTRY

TIME: 3 HOURS **MAXIMUM MARKS:80**

A. Long answer question **(2 X10=20)**

1. a) Write in detail about the Hetero polysaccharides and mention its importance.

(Or)

b) How is acid base balance maintained in the body?

2. a) Define and classify Lipids with suitable examples.

(Or)

b) Write in detail about the RDA, dietary sources, and biochemical role and deficiency manifestations of folic acid.

B. Short answer questions -Answer any 5 questions **(5X 6=30)**

1. Mention dietary sources and functions of cholesterol
2. Define Chromatography & write any4applications
3. Classify Carbohydrates with a suitable example
4. Classify Enzymes systematically by providing one example under each class.
5. Define carcinogen and name any three agents that cause carcinogenesis.
6. List down the sources, regulation and functions of Calcium

C. Very Short answer questions –Answer any10 questions **(10 x 3=30)**

1. Define Respiratory quotient
2. Define buffer
3. List any two functions of trace elements.
4. List any two impacts of plastics on society
5. Mention the essential fatty acids and its importance
6. List any 2 functions of phospholipids
7. Name one test to identify plasma proteins and urea.
8. Define osmolality
9. Mention any one cardiac glycoside with its function
10. Draw a neat labeled diagram of DNA
11. Define mutarotation
12. List any two functions of Fat soluble vitamin

GENERAL MICROBIOLOGY

SYLLABUS FOR I YEAR
B.Sc. ALLIED HEALTH SCIENCES – GENERAL MICROBIOLOGY

NAME OF THE SUBJECT PAPER	**: GENERAL MICROBIOLOGY**
DURATION OF THEORY CLASSES	**: 40 hrs**
DURATION OF TUTORIAL SESSIONS	**: 16 hrs**
DURATION OF LAB TRAINING	**: 38 Hrs**
EXAMINATION	**: 50 marks (40 U+10IE)**
NO UNIVERSITY PRACTICAL EXAMINATION	
DURATION OF THEORY EXAMINATION	**: 1 ½ hrs**
YEAR IN WHICH THE SUBJECT PAPER IS TAUGHT	**: IYEAR**

COURSE DESCRIPTION

The course is designed to assist students to acquire understanding of fundamentals of microbiology and identification of microorganisms. It also provides opportunities for practicing infection control measures in hospital setting.

COURSE OBJECTIVES

At the end of the course, the student will be able to:

1. Identify common disease producing microorganisms
2. Explain the basic principles of microbiology and their significance in health and disease. Demonstrate skill in handling specimens.
3. Explain various methods of disinfection and sterilization
4. Identify the role of the nurse in hospital infection control system.

COURSE OUTCOMES FOR GENERAL MICROBIOLOGY

At the end of the course, students will be able to...

MIC-AHS-CO1: Sterilize the articles with physical and chemical methods

MIC-AHS-CO2: Perform with suitable culture media, methods for growth of the bacteria and perform staining techniques for identification of bacteria

MIC-AHS-CO3: Learn the structure, function of immune system and immunity by its antigen-antibody reactions

MIC-AHS-CO4: Learn the how to collect & process the specimen for the diagnostic purposes

MIC-AHS-CO5: Learn about the identification of fungal infections from clinical specimens and various antifungal agents used for the fungal infections.

MIC-AHS-CO6: Learn the laboratory diagnosis of Parasitic and Viral infections

MIC-AHS-CO7: Learn about the treatment and post exposure prophylaxis (PPE) of viral infections

UNIT	TITLE	THEORY + TUTORIALS (40 +16) HOURS
I	**GENERAL BACTERIOLOGY** ▫ Historical introduction Classification of Microorganisms based on size, shape and structure ▫ Anatomy & Physiology of Bacteria : Nutrition, Growth ▫ Microscopy, staining techniques & Culture media, culture methods ▫ Sterilization (physical &chemical methods) Infection	8 +2
II	**IMMUNOLOGY** ▫ Immune response ▫ Immunity ▫ Hyper sensitivity, Autoimmunity ▫ Complement ▫ Antigen antibody reactions	7 + 2
III	**SYSTEMATIC BACTERIOLOGY** ▫ Introduction : Collection transport & processing of bacteriological clinical specimen in general ▫ Pyogenic cocci ▫ Spore baring bacilli Clostridium +Bacillus ▫ Enterobacteriaceae- E.coli, Klebsiella, Salmonella, Shigella ▫ Vibrio, Pseudomonas **MYCOLOGY** ▫ Introduction, classification of fungi, laboratory diagnosis in general ▫ Fungi of medical importance-Opportunistic fungi	8 + 3
IV	**BASICS OF PARASITOLOGY** ▫ Introduction to Parasitology, Classification, Protozoa-I – Entamoeba histolytica ▫ Protozoa-II, Plasmodium spp. ▫ Cestodes: general, T.solium&T.saginata, E.granulosus ▫ Nematodes: Introduction &Classification - Intestinal -Ascaris, Ancylostorma, Strongyloides - Tissue-W.bancrofti	7 +3
V	**VIROLOGY** ▫ Classification & General properties of Viruses, Virus Host interactions & Lab diagnosis in general ▫ DNA Viruses : Pox viruses &Adenoviruses, Herpes viruses ▫ Hepatitis virus, HIV ▫ Rabies , Polio, Arbo viruses common in India – Dengue, Chickenkuniya , Japanese encephalitis, KFD	6 + 4
VI	**HOSPITAL INFECTION AND CONTROL** ▫ Causative agents and methods of transmission ▫ Systematic investigation of hospital infection ▫ Prevention and control of Hospital infections ▫ Environmental Hazards resulting from biomedical waste and preventive measures.	4 + 2

LAB TRAINING (38 hrs)

- Introduction & visit to microbiology lab + Morphology of bacteria + Identification of bacteria (Culture plates & Basic biochemical reactions)
- Gram stain, Acid fast Stain
- Spotters , Instruments, Culture media inoculated & uninoculated
- Applied Immunology(Bacterial)
- Serological tests – CRP, ASO, RPR, Widal Applied Immunology (Virology) Serological tests: HIV, HBsAg(Rapid Tests)
- Stool Examination for eggs + Parasitology specimens

METHODS OF TEACHING

1. Lecture cum discussion
2. Demonstration
3. Lab visit
4. Practical work record

METHODS OF EVALUATION

1. Written Test
2. Laboratory Observation Book
3. Assignments
4. Oral Presentations

REFERENCE BOOKS

1. Ananthnarayan R: Textbook of Microbiology.(2017)
2. Pommerville J. C: Fundamentals of Microbiology. Jones and Bartlett learning(2013)
3. ApurbaSastry, SandhyaBhat. Essentials of Microbiology.
4. Text book of Concise Microbiology by C.P.Baveja, Latest edition

BLUE PRINT - B.Sc ALLIED HEALTH SCIENCES –GENERAL MICROBIOLOGY (I Year)

Unit No.	Unit	Weightage (%)	Marks Allotted	Knowledge/ Recall			Understanding			Application		
				LAQ (10)	SAQ (6)	VSAQ (3)	LAQ (10)	SAQ (6)	VSAQ (3)	LAQ (10)	SAQ (6)	VSAQ (3)
I	GENERAL BACTERIOLOGY	8	3	1*								1
II	BASICS OF IMMUNOLOGY	15	6			1*		1				
III	SYSTEMATIC BACTERIOLOGY	25	10				1				1*	
IV	BASICS OF PARASITOLOGY& MYCOLOGY	22	9					1				1
V	VIROLOGY	22	9		1							1
VI	HOSPITAL INFECTION AND CONTROL	8	3		1*				1			
	TOTAL	**100**	**40**									

The duration of Examination (University) is One and Half (1 ½) hours.

The total marks for the University Examination will be 40marks.

Long Answer Questions : 1X10mark = 10 marks (Choice 1 out of2)

Short Answer Questions : 3X6marks = 18 marks (Choice 3 outof5)

Very Short Answer Questions : 4 X3 marks = 12marks (Choice 4 out of5)

TOTAL = 40 marks

MODEL QUESTION PAPER
FIRST YEAR B.Sc. ALLIED HEALTH SCIENCES
GENERAL MICROBIOLOGY

Time: 1½Hours **Maximum Marks: 40**

Illustrate your answers with suitable diagrams wherever necessary.

(A) Long answer questions **(1 X 10=10)**

1. Describe the commonly used chemical disinfectants and their applications in the hospital.

(OR)

2. Classify Mycobacterium. Give an account on pathogenesis and laboratory diagnosis of pulmonary tuberculosis. Add a note on BCG vaccine.

(B) Short answer questions -Answer any 3 questions marks **(3 X6=18)**

1. Define immunity. Describe acquired immunity.
2. Types of HAI & mention the causative agents.
3. Name the UTI cause bacteria. How to collect urine & laboratory diagnosis of *E.coli*.
4. Life cycle of malaria parasite in human.
5. Write about Modes of transmission of HIV.

(C) Very Short answer questions –Answer any 4 questions **(4 x3 =12)**

1. Mention different color coded bags for biological waste management used in hospital with the viruses.
2. Prophylaxis of hepatitis B.
3. List FOUR bacteria causing wound infection.
4. Name the opportunistic fungi.
5. Name four arbo viral diseases common in India.

GENERAL PATHOLOGY

SYLLABUS FOR I YEAR
B.Sc. ALLIED HEALTH SCIENCES – GENERAL PATHOLOGY

NAME OF THE SUBJECT PAPER : GENERAL PATHOLOGY

DURATION OF THEORY CLASSES : 40hrs

DURATION OF TUTORIAL SESSIONS : 16hrs

DURATION OF LAB TRAINING : 38Hrs

EXAMINATION : 50 marks (40 U + 10IA)

NO UNIVERSITY PRACTICAL EXAMINATION

DURATION OF THEORY EXAMINATION : 1 ½hrs

YEAR IN WHICH THE SUBJECT PAPER IS TAUGHT : IYEAR

COURSE DESCRIPTION

To make the student to understand pathology laboratory reports, the normal ranges of investigations, severity and specificity of disease conditions which will help him perform International Classification of diseases to clinical pertinence.

COURSE OBJECTIVES

On completion of this subject, the student will be able to:

- Differentiate between symptoms and diseases
- Understand the needs of mandatory diagnostic procedures
- Demonstrate an understanding of the pathology of common diseases
- Understand various pathology laboratory reports
- Know about the possibilities and consequences of nosocomical infections, needle prick injuries etc., in a health care facility

COURSE OUTCOMES FOR GENERAL PATHOLOGY

At the end of the course, students will be able to...

PAT-AHS-CO1: Learns the pathophysiology of disease and its causes and progression

PAT-AHS-CO2: Learns the etiologies, the pathogenesis, and the host response specific to a particular organ system

PAT-AHS-CO3: Learn about lab investigations and techniques in Hematology.

PAT-AHS-CO4: Learns to perform cross matching, coombs test, blood grouping and TTI

PAT-AHS-CO5: Learns the diagnosis of disease based on the laboratory analysis of bodily fluids

UNIT	TITLE	THEORY + TUTORIALS (40 +16) HOURS
I	**GENERAL PATHOLOGY (12 +3 HOURS)** Basic Concepts in Cellular Adaptions • Cell injury and Cell death • Over view of Cellular adaption Basic Principles in Inflammatory Process • General features of acute and Chronic inflammation repair. • NEOPLASIA • Definition of Neoplasia • Differences between Benign and Malignant tumors • Nomenclature	10 + 5
II	**HAEMATOLOGY** **Structure and functions of Blood cells** • Objective use of anticoagulants • Mechanisms of Haemostasis • Tests to monitor Coagulation • Blood Grouping and Blood Bank (Basic aspects on Blood Components) • Basic concepts in Anemia • Basic Concepts of Leukemia	10 + 3
III	**BIOMEDICAL WASTE MANAGEMENT AND ENVIRONMENTAL PATHOLOGY** • Biomedical waste management from perspectives of Pathology • Environment and Disease – Smoking hazards, Asbestosis and Silicosis Occupational Exposure	5 + 2
IV	**CLINICAL PATHOLOGY** • Collection, transport, preservation and processing of Clinical Specimen • Clinical Pathology of specialized Body Fluids(CSF), Synovial fluid, Pleural Fluid • Urine Examination(Urinalysis)	5 + 2
V	**OVERVIEW OF SYSTEMIC PATHOLOGY** • Rheumatic Heart Disease ineffective endocarditic, atherosclerosis, IHD – Basic Concepts. • Lungs : Pneumonia, COPD, Asthma, ARDS – Basic Concepts • Gastrointestinal tract – Peptic Ulcer, Carcinoma Stomach, Carcinoma Colon –Basic Concepts. • Liver: Hepatitis, Cirrhosis, Gall Bladder –basic	10 + 4

	Concepts. • Brain Tumor. • Kidney – Renal Calculi, Hydronephrosis, renal Tumor – Basic Concepts. • FGT – Leiomyoma, Endometrial hyperplasia, Endometrial Cancer, Cervical Cancer –Basic Concepts. • FGT – Ovarian Tumor classifications – Basic Concepts. • Breast – Benign and Malignant tumors – Basic Concepts • Bone Tumors – Basic Concepts	

LAB TRAINING (38 hrs)

1. Blood Grouping and Rh typing
2. Urine Routine
3. Hb, TLC,DLC
4. Gross Specimens
5. Slides

METHODS OF TEACHING

1. Lecture cum discussion
2. Demonstration
3. Lab visit
4. Practical work record

METHODS OF EVALUATION

1. Written Test
2. Laboratory observation Book
3. Assignments
4. Oral Presentations

REFERENCE BOOK

1. Culling Histopathology techniques
2. Bancroft Histopathology techniques
3. Todd & Sanford Clinical Diagnosis by laboratory method
4. Dacie & Lewis – Practical Haematology
5. RamanicSood, Laboratory Technology (Methods and interpretation) 4thEd.

B.Sc. ALLIED HEALTH SCIENCES – PATHOLOGY (I Year)-BLUE PRINT

Unit No.	Unit	Weightage	Marks Allotted	Knowledge/ Recall			Understanding			Application		
				LAQ (10)	SAQ (6)	VSAQ (3)	LAQ (10)	SAQ (6)	VSAQ (3)	LAQ (10)	SAQ (6)	VSAQ (3)
I	a) BASIC CONCEPTS IN CELLULARADAPTIONS b) BASIC PRINCIPLES IN INFLAMATORY PROCESS c) NEOPLASIA	37.5%	15	1*	2	1	-	1*	1*	-	-	-
II	HAEMATOLOGY	22.5%	9	-	1	1	-	-	-	-	-	-
III	BIOMEDICAL WASTE MANAGEMENT AND ENVIRONMENTAL PATHOLOGY	7.5%	3	-	-	-	-	-	1	-	-	-
IV	CLINICAL PATHOLOGY	7.5%	3	-	1*	1	-	-	-	-	-	-
V	OVERVIEW OF SYSTEMIC PATHOLOGY	25%	10	1	-	-	-	-	-	-	-	-

The Duration of Examination (University) is One and Half hours (1 ½) hours.

The total marks for the University Examination will be 40 marks.

Lon Answer Questions : 10X1marks = 10 marks (Choice 1 out of 2)

Short Answer Questions : 3 X6marks = 18 marks (Choice 3 out of5)

Very Short Answer Questions : 4 X3marks = 12 marks (Choice 4 out of5)

TOTAL = 40 marks

MODEL QUESTION PAPER
FIRST YEAR B.Sc. ALLIED HEALTH SCIENCES
GENERAL PATHOLOGY

Time: 1½Hour **Maximum Marks: 40**

Illustrate your answers with suitable diagrams wherever necessary.

(A) Long Answer Questions **(1X10=10)**

1. Mention the types of necrosis with examples

(Or)

2. Describe about Myocardial infarction

(B) Short Answer Question **(3X6=18)**

Answer any THREE of the following

1. Tabulate the difference between Benign and Malignant tumors
2. Define anemia. Mention types of anemia, on the basis of Etiology.
3. Explain the mode of spread of tumors in brief.
4. Explain granulomatous inflammation with a neat labeled diagram
5. Describe the method of collection, transport and preservation of CSF

(C) Very Short Answer Questions **(4X3=12)**

Answer any FOUR of the following

1. Define Apoptosis.
2. Enumerate two colors coding for various biomedical waste disposal with examples.
3. Define cross matching
4. Mention two types of Necrosis.
5. Define Pneumonia.

I YEAR ELECTIVE COURSES

SYLLABUS FOR I YEAR
B.Sc. ALLIED HEALTH SCIENCES
ABILITY ENHANCEMENT COMPULSORY COURSE (AECC) - ENGLISH

NAME OF THE SUBJECT PAPER	**: ENGLISH**
DURATION OF THEORY CLASSES	**: 16hrs**
DURATION OF PRACTICAL SESSIONS	**: 34hrs**
EXAMINATION	**: 100 marks (80 U + 20 IA)**
NO UNIVERSITY PRACTICAL EXAMINATION	
DURATION OF THEORY EXAMINATION	**: 1 ½ hrs**
YEAR IN WHICH THE SUBJECT PAPER IS TAUGHT	**: I YEAR**

COURSE OUTCOMES FOR ENGLISH

ENG-CO1: Speak and write grammatically correct sentences in English

ENG-CO2: Develop effective writing skills needed for clinical task

ENG-CO3: Build fluency in English needed for clinical tasks

SYLLABUS
(THEORY & PRACTICALS = 16 +34 Hours)

COURSE DESCRIPTION

This course is designed to build spoken and written English competency of the students needed to function effectively in academic setup.

OBJECTIVES

On completion of this subject, the student will be able to:

1. Speak and write grammatically correct sentences in English.
2. Develop effective writing skills.
3. Build fluency in English

UNIT: I GRAMMAR

1. Remedial Grammar : Parts of speech; Types of sentences, question tags
2. Modal verbs
3. Tenses
4. Concordance

UNIT: II VOCABULARY

1. Word formation – prefixes and suffixes
2. Medical terminology
3. Words often misused or confused
4. Idioms and phrases

UNIT: III WRITING SKILLS

1. Letter writing - permission, leave and other official letters
2. Note making methods
3. Jumbled sentences -cohesion
4. Paragraph Writing

UNIT: IV SPOKEN COMMUNICATION

1. Pronunciation of commonly mispronounced words
2. Day today conversation
3. Telephonic conversations
4. Group Discussions

UNIT: V LISTENING AND READING SKILLS

1. General Listening and reading comprehension

Textbook Recommended

1. Effective English Communication by Krishna Mohan and Meenakshi Raman, Tata McGraw – Hill Publishing Company Limited, New Delhi.
2. English for Colleges and Competitive Exams by Dr. R. Dyvadatham, Emerald Publishers.

SYLLABUS FOR I YEAR
B.Sc. ALLIED HEALTH SCIENCES
SKILL BASED ELECTIVE COURSE (SBEC) – CULINARY SKILLS FOR OPTIMAL NUTRITION

NAME OF THE SUBJECT PAPER : CULINARY SKILLS FOR OPTIMAL NUTRITION

DURATION OF THEORY CLASSES : 16 Hrs

DURATION OF PRACTICAL SESSIONS : 32Hrs

PRACTICAL EXAMINATION : 50 Marks (40 U + 10 IA)

NO UNIVERSITY THEORY EXAMINATION

DURATION OF EXAMINATION : 1 ½ Hrs

YEAR IN WHICH THE SUBJECT PAPER IS TAUGHT: IYEAR

COURSE OUTCOMES

NUTRI-CO1: Understand the basic food groups, their nutrient composition and function for balanced healthy diet for people of all ages & patients on dietary management for healthy life.

THEORY & PRACTICALS (DURATION 16 + 32 Hours)

UNIT-I INTRODUCTION TO FOODS AND NUTRITION

- Food-Definition of foods, nutrition and nutrients characteristics of good health
- Relation of nutrition to good health-optimal nutrition, malnutrition and over nutrition
- Classification of foods based on major nutrient content
- Food selection-factor responsible for food selection

UNIT-II FOODS GROUPS

- Basic four and five food groups-cereals, millets pulses, fruits and vegetables, fats and oils, sugar and jaggery.
- Foods and nutrients, Functions of food- energy yielding, body building and protective foods, balanced diet, vegetarian and non-vegetarian foods
- Functional Foods-Dietary supplements
- Food Adulterations-Common adulterants and method of identification, nutrition labeling and food standards

UNIT-III METHODS OF COOKING, PRESERVATION AND SENSORY EVALUATION

- Principles and techniques of sensory evaluation, Interpretation tools
- Cooking methods-moist heat, dry heat advantages and disadvantages, changes during cooking, nutrient preservation while cooking
- Preservation techniques advantages and disadvantages

UNIT-IV NUTRITIONAL REQUIREMENTS AND MEAL PLANNING

- Basic nutritional requirements through different stages of life cycle, basic principles of meal planning, revisiting concept of balanced diet.

PRACTICALS

- Introduction to cutlery and crockery
- Introduction to weights and measures
- Art of table setting
- Market survey on food labeling
- Preparation of few commonly consumed cereal preparation
- Preparation of few commonly consumed pulse dishes
- Vegetable cooking without nutrient loss
- Preparation and display of fruits salads
- A day‘s menu for an adult sedentary worker
- A day‘s menu for an 8-month old infant
- Nutritious snacks for pre schooler
- Nutritious lunch for school going boys and girl
- Consistency modified menu for an 80-year-old
- Simple test to identify food adulteration
- Sensory evaluation of prepared items

METHODS OF TEACHING

1. Lecture cum discussion
2. Demonstration
3. Lab visit
4. Practical work record

METHODS OF EVALUATION

1. Written Test
2. Laboratory observation Book
3. Assignments
4. Oral Presentations

Reference book

1. Srilaksmi.B. : Food science; seventh edition(2012)
2. Jacqueline B .Marcus :Culinary Nutrition: The science and practice of healthy cooking:(2014)

SYLLABUS FOR I YEAR
B.Sc. ALLIED HEALTH SCIENCES
SKILL BASED ELECTIVE COURSE (SBEC) – ENHANCING SOFT SKILL & PERSONALITY

NAME OF THE SUBJECT PAPER : Enhancing soft skill & personality

DURATION OF THEORY CLASSES : 16Hrs

DURATION OF PRACTICAL SESSIONS : 32Hrs

PRACTICAL EXAMINATION : 50 Marks (40 U + 10 IA)

NO UNIVERSITY THEORY EXAMINATION

DURATION OF EXAMINATION : 1 ½ Hrs.

YEAR : I YEAR

COURSE OUTCOMES

ESSP-CO1: Foster healthy attitude and develop effective inter and intra personal skills to be an effective team worker in both academic and professional setup.

LEARNING OBJECTIVES

This course is designed to equip the students with essential soft skills needed for workplace and improve personality.

SYLLABUS

UNIT: I ASPECTS OF COMMUNICATION

1. Importance of communication, Process, Barriers
2. Nonverbal Communication

UNIT: II SPEAKING

1. Opening and Closing conversations
2. Introductions and Address Systems
3. Expressing Courtesy
4. Giving Compliments and replying to Compliments
5. Presentation Skills
6. Telephonic conversation and telephone etiquette

UNIT – III PRESCRIBED READING

1. White washing the Fence – Episode from Tom Sawyer by Mark Twain
2. Bacon's Essays: - Of Goodness and goodness of nature

UNIT – IV WRITING

1. Letter writing - Letter of Complaints, Inviting and Declining an invitation
2. Memos and Email
3. Editing- Grammar, Spelling & Punctuation, Use of Dictionary &Thesaurus.

UNIT – V SOFT SKILLS

1. Active Listening Skills
2. Assertive Skills
3. Negotiation and Persuasive Skills
4. Interview Skills

Reference Books

1. Communication Skills for Engineers and Scientists by Sangeeta Sharma and Binod Mishra, PHI Learning Private Limited, New Delhi.
2. English and soft skills by S.P. Dhanavel, Orient Black Swan
3. Effective English Communication by Krishna Mohan and Meenakshi Raman, Tata McGraw –Hill Publishing Company Limited.
4. Technical Communication – Principles and Practice, by Meenakshi Raman and Sangeetha Sharma, II edition, Oxford University Press.

Learning Outcome

This course is designed to help the students to

- Foster healthy attitude.
- Develop effective inter and intra personal skills to be an effective team worker.
- Communicate effectively in both academic and professional setup

SYLLABUS FOR I YEAR
B.Sc. ALLIED HEALTH SCIENCES
SKILL BASED ELECTIVE COURSE (SBEC) – SPEAKING EFFECTIVELY

NAME OF THE SUBJECT PAPER : SPEAKING EFFECTIVELY

DURATION OF THEORY CLASSES : 16Hrs

DURATION OF PRACTICAL SESSIONS : 32Hrs

PRACTICAL EXAMINATION : 50 Marks (40 U + 10 IA)

NO UNIVERSITY THEORY EXAMINATION

DURATION OF EXAMINATION : 1 ½ Hrs.

YEAR IN WHICH THE SUBJECT PAPER IS TAUGHT: I YEAR

COURSE OUTCOMES

SPEAK-CO1: Speak and write grammatically correct sentences in English and Build fluency in English needed for clinical tasks.

LEARNING OBJECTIVES

- Advance the students intellectual curiosity, competency and skills in preparation for employment
- Develop critical thinking, creativity and effective communication

SYLLABUS

1. Communication Skills

- Importance of Communication skills in Public health; Communication process; Methods of communication; Types of communication: Verbal and Non-verbal; Impediments to effective communication; Feedback

2. Oral Presentation Skills

- Preparation and planning; Structure; Audio-visual aids; Creating interest and establishing a relationship with the audience; Body language; Voice and pronunciation; Review

3. Writing skills

- Writing a scientific paper; Writing a proposal; Structure of an article; References and literature review; Peer-review process-Publication bias; International guidelines for publication in journals; Professional Ethics

4. Leadership in Public health

- Leadership styles and trait; Motivation skills; Interpersonal communication skills; Problem solving skills; Decision making skills; Management skills; Communication Skills

5. Manuscript writing

- Writing introduction, objectives, methodologies, major finding, discussion, conclusion and recommendation

6. Seminar presentations

- Use of computers present data and information on recent topics

LEARNING OUTCOMES

At the completion of the course, the students will-

- Develop good written and oral communication abilities
- Develop an understanding of team building and leadership skills
- Develop knowledge regarding capacities needed to work independently within diverse work environments

TEXT BOOKS

1. Professional Writing Skills, A self-paced training Programme by Janis Fisher Chan and Diane Lutovich.

2. Speaking Your Mind: Oral Presentation and Seminar Skills By Rebecca Stott, Tory Young, Cordelia Bryan Contributor Rebecca Stott, Tory Young, Cordelia Bryan.

SYLLABUS FOR I YEAR
B.Sc. ALLIED HEALTH SCIENCES
SKILL BASED ELECTIVE COURSE (SBEC) – BASICS OF YOGA AND PRACTICE

NAME OF THE SUBJECT PAPER : BASICS OF YOGA AND PRACTICE

DURATION OF THEORY CLASSES : 16Hrs

DURATION OF PRACTICAL SESSIONS : 32Hrs

PRACTICAL EXAMINATION : 50 Marks (40 U + 10 IA)

NO UNIVERSITY THEORY EXAMINATION

DURATION OF EXAMINATION : 1 ½ Hrs

YEAR IN WHICH THE SUBJECT PAPER IS TAUGHT : I YEAR

SYLLABUS & COURSE OUTCOMES FOR BASICS OF YOGA & PRACTICE (YOGA)

YOGA CO1: Understand the respiratory system, types of breathing and benefits of meditation.

Unit	TIME(HRS)	CONTENT
1	1	Introduction to Yoga philosophy, psychology and lifestyle
2	1	A brief outline of the history of Yoga.
3	1	Cultivation of correct psychological attitudes
4	1	Asanas : Definition, Types, scope and limitations of Asanas
5	1	Pranayamas and their significance in Yogic curriculum, Types & phases of Pranayama.
6	1	Dharna and Dhyana as the keys to unlocking human potential.
7	1	Study of various aspects of Yoga: Kriyas, Bandhas, Mudras
8	1	Yoga defined as ―Integration‖ and ―Harmony‖
9	1	Meaning of the term ―Positive Health‖
10	1	Yoga, a tool to restore homeostasis
11	1	Integration of Yoga into Health Professions Education
12	1	Order of teaching the Yogic practices; Do‘s and Dont‘s of specific Yoga techniques.
13	2	Applied aspects of Yoga in various human activities like therapeutics, education and sports
14	2	Introduction to yogic concept of health and disease

Unit 15: Introduction to Yogic techniques: Methods and practices (32 hours)
Asanas (26 hrs):

- Aruna Surya Namaskar
- Ardha – Padmasana/Padmasana
- ArdhakatiChakrasana
- PadaHasta
- PavanaMuktasana
- Trikona
- Navasana
- Ardha –Shalabhasana
- Shalabhasana
- Makarasana
- Bhujangasana
- Dhanurasana
- Vakrasana
- Vrikshasana
- Ushtrasana
- Gomukasana
- Yoga Mudra.
- Natarajasana
- Chakra sana
- Sarvangasana
- Matsyasana
- Halasana
- Shavasana

Pranayama (6 hrs)

- Vibhaga Pranayama
- Pranava Pranayama
- Savitri Pranayama
- Chandra and SuryaNadi Pranayama
- Nadi–Shuddhi
- Sheetali and Sitkari

TEXT BOOKS

- Dayanidy G and Bhavanani AB. CYTER Practical Book. Pondicherry, India: Dhivyananda Creations;2016.
- A primer of Yoga Theory – Dr Ananda Balayogi Bhavanani, Dhivyananda Creations,Pondicherry-13
- Fundamentals of Yoga History- Compilation by Meena Ramanathan
- Basic Hatha Yoga lessons (Tamil) – Dr Ananda Balayogi and Meena Ramanathan, Puducherry

BOOKS RECOMMENDED FOR STUDIES AND REFERENCE

1. A yogic approach to stress-Dr Ananda Balayogi Bhavanani, Ananda Ashram, Pondicherry
2. Asana, Pranayama, Mudra and Bandha. Swami Satyananda, Bihar School of Yoga,Monger
3. ASANAS : WHY? AND HOW? – byShri. O.P. Tiwari.Kaivalyadhama,Lonavla.
4. Hatha Yoga practices of the Gitananda tradition by Dr Ananda Balayogi Bhavanani
5. Ramanathan Meena. Applied Yoga: Applications of Yoga in Different Fields of Human Activities. 3rdEd; Pondicherry, India: Sri BalajiVidyapeeth;2018
6. PRANAYAMA – by Swami Kuvalayananda. Kaivalyadhama, Lonavla.
7. Yoga and sports- Swami Gitananda and Meenakshi Devi, Ananda Ashram, Pondicherry.

SYLLABUS FOR I YEAR

B.Sc. ALLIED HEALTH SCIENCES

GENERIC ELECTIVE COURSE (GEC) – BASICS OF HOSPITAL ADMINISTRATION

NAME OF THE SUBJECT PAPER : BASICS OF HOSPITAL ADMINISTRATION

DURATION OF THEORY CLASSES : 64Hrs

THEORY EXAMINATION : 50 Marks (40 U + 10 IA)

NO UNIVERSITY PRACTICAL EXAMINATION

DURATION OF THEORY EXAMINATION : 1 ½ HRS

YEAR IN WHICH THE SUBJECT PAPER IS TAUGHT : IYEAR

COURSE OUTCOMES

HSM CO1: To familiarizes students with the basics concepts, policies of hospital management regarding the occupational safety, organizational behavior & quality management.

COURSE OBJECTIVES

- To provide orientation about the hospital functions
- To familiarize students with the basics concepts of hospital management

THEORY (DURATION 64 Hours)

UNIT: I ORGANISATION OF A HOSPITAL AND ITS DEPARTMENTS

1. Organogram
2. Vision, Mission &Values, Logo
3. Patient Service Points – Clinical & Non-Clinical (OPD‘s, A&E, MHC, Wards, ICU‘s, OT‘s, etc.)
4. Scope of Services (Medical &Supportive Services)

UNIT: II HOSPITAL POLICIES & PROCEDURES

1. Registration Process
2. OP/IP Billing
3. Admission Process
4. Discharge Process
5. Financial counseling
6. Visitors Policy
7. Feedback forms.

UNIT: III MEDICAL RECORS MANAGEMENT/LEGAL ASPECTS

1. Types of Medico legal cases 2.SOP‘s for handling MLC

3. Medical Records -Forms, consents, registers used in hospitals

UNIT: IV QUALITY MANAGEMENT

1. Quality – Brief Introduction
2. Code of Conduct for health care professionals
3. Patient rights &responsibilities
4. Incident Reporting
5. Quality indicators
6. List of Licenses to be obtained to run a Hospital College
7. Accreditation–ISO/NABH/JCI

UNIT: VOCCUPATIONAL SAFETY

1. Biomedical Waste Management
2. Hospital Spill Management
3. Usage of PPE
4. Emergency Codes
5. Fire Safety Management
6. Hospital Infection Control

UNIT: VI ORGANISATIONAL BEHAVIOUR

1. Communication with patients/health care professionals
2. Grooming standards
3. Time Management
4. Grievance Handling, Interdisciplinary Committee
5. Leadership

LEARNING OUTCOMES

Students will have an overview of hospital functions, processes and patient management.

SYLLABUS FOR I YEAR
B.Sc. ALLIED HEALTH SCIENCES
GENERIC ELECTIVE COURSE (GEC) – COUNSELING AND GUIDANCE

NAME OF THE SUBJECT PAPER	**: COUNSELING AND GUIDANCE**
DURATION OF THEORY CLASSES	**: 64Hrs.**
EXAMINATION	**: 50 Marks (40 U +10IA)**
NO UNIVERSITY PRACTICAL EXAMINATION	
DURATION OF THEORY EXAMINATION	**: 1 ½ Hrs.**
YEAR IN WHICH THE SUBJECT PAPER IS TAUGHT	**: I YEAR**

COURSE OUTCOMES

CG CO1: To assess a person's needs and understand their personal characteristics that will help in personal growth, wellbeing and improving their relationships with others.

LEARNING OBJECTIVES

- To understand theoretical foundations of counseling psychology
- To examine briefly the major perspectives of Counselling and to apply based on the client's needs
- To assess ones own needs and motivations and personal characteristics that will help in personal growth and well being.
- To understand basic counseling skills as practiced by an effective counsellor.
- To discuss special settings and populations where Counselling could be effectively used.
- To explore ethical and legal issues for the practice of counseling profession.

SYLLABUS

UNIT I:

Introduction and definition of Counselling and Guidance, Counsellor Preparation, Qualifications, Qualities, Legal and Professional ethics

UNIT- II:

Different approaches to counselling, goals in counselling, role and functions of the counsellor.

UNIT- III:

Micro skills in Counselling- relationship building strategies and methods: Opening techniques, attending skills- verbal and non-verbal communication, Listening skills:

Open questions and closed questions, Encouragement, Paraphrasing, Reflection, Summarization, influencing skills-Reframing, genuineness and Self-disclosure.

UNIT-IV:

Macro skills in Counselling, empathy, advanced empathy, Confrontation & challenging, Resistance, transference and counter-transference

UNIT-V:

Counselling situations and Counselling across life-span.

Learning Outcome

At the end of this course, the students will be able to:

Demonstrate basic knowledge in counseling (concepts, theories, ethical issues, basic skills, etc.)

SYLLABUS FOR I YEAR
B.Sc. ALLIED HEALTH SCIENCES
GENERIC ELECTIVE COURSE (GEC) – LIFESTYLE DISORDERS

NAME OF THE SUBJECT PAPER	**: LIFESTYLE DISORDERS**
DURATION OF THEORY CLASSES	**: 64Hrs**
EXAMINATION	**: 50 Marks (40 U +10IA)**
NO UNIVERSITY PRACTICAL EXAMINATION	
DURATION OF THEORY EXAMINATION	**: 1 ½ Hrs.**
YEAR IN WHICH THE SUBJECT PAPER IS TAUGHT	**: I YEAR**

COURSE OUTCOMES

LD CO1: To understand the relevance, significance and implications of lifestyle disorders for the betterment of human life quality.

THEORY (64 Hours)

UNIT I Modern Life style disorders

Desk bound and sleeping habits, junk food, anxiety. Food poisoning, Acidity.

UNIT II Dietary disorders

Food groups and concept of a balanced diet, obesity, metabolic syndrome, hypertension- their causes and prevention through dietary and lifestyle modifications

UNIT III Social health problems

Smoking, alcoholism, drug dependence and Acquired Immune Deficiency Syndrome (AIDS).

UNIT IV Gastrointestinal disorders

Stomach disorders-Gastritis, Ulcer, Amoebiasis, Constipation, piles
Common ailment- cold, cough, fevers, diarrhea, constipation- their causes and dietary

LEARNING OUTCOMES

To understand the relevance, significance and implications of lifestyle disorders for the betterment of human life quality

Text Books

1. Text book of Clinical Biochemistry-Carl.A. Burtis and EdwardR.Ashwood
2. Text Book of Medical Biochemistry–Dr.M.N.Chatterjee and Rane Shinde

Reference Books

1. P. Singh MD. Textbook of Nutrition and Health; First Ed; 2008; Academic Excellence Biochemistry with Clinical Correlation- Thomas M.Devl

II YEAR

B.Sc. - OPTOMETRY
FACULTY OF ALLIED HEALTH SCIENCES SRI BALAJI VIDYAPEETH
(Deemed to be University)
Accredited by NAAC with 'A' Grade

II-YEAR

CORE SUBJECTS

1. Physical & Geometrical Optics and Principles of Lighting
2. Optometric Optics
3. Ocular Diseases
4. Visual Optics, Optometric Instrumentation & Examination of The Visual System

ELECTIVES

Ability Enhancement compulsory course (AECC)

1. Environmental studies

Skill enhancement course (SEC) – Choose any TWO

1. Good Clinical Laboratory practice
2. Computer Applications
3. Library and E-resource
4. Public Health and Hygiene

Generic Elective Course (GEC) – Choose any ONE

1. Basic Psychology
2. Sociology
3. Entrepreneurship essentials

AHS Course Content Second year B.Sc. OPTOMETRY (OPT)

Faculty code	Category	Course title	Hours					Credits				
AHS	Core theory OPT	Subjects	Theory	Practical	Tutorials	Clinical training	Total hours	Lecture	Practical	Tutorials	Clinical training	Total credits
AHS	OPT -5	Physical & Geometrical Optics and Principles Of Lighting	80		32			5		1		6
AHS	OPT -6	Optometric Optics	80		32			5		1		6
AHS	OPT -7	Ocular Diseases	80		32			5		1		6
AHS	OPT -8	Visual Optics, Optometric Instrumentation & Examination Of The Visual System	64	64				4	2			6
AHS	OPT-CT 1	Clinical Training OPT 5 to 8				192					6	6
AHS	AECC	Environmental Science	16	34				1	1			2
AHS	SEC – 1-3	Student‘s choice	16	32				1	1			2
AHS	SEC – 1-3	Student‘s choice	16	32				1	1			2
AHS	GEC - 1-3	Student‘s choice	64					4				4
			432	**98**	**128**	**192**	**850**	**27**	**3**	**4**	**6**	**40**

SCHEME OF EXAMINATION

Papers	Subject	Theory		Practical		Theory	Practical	Grand total 800	Min marks topass % (400)
		UE	IA	UE	IA	UIA*	UIA*		
OPT -5	Physical & Geometrical Optics and Principles Of Lighting	80	20					100	50
OPT -6	Optometric Optics	80	20					100	50
OPT -7	Ocular Diseases	80	20					100	50
OPT -8	Visual Optics, Optometric Instrumentation & Examination Of The Visual System	80	20	80	20			200	100
OPT-CT 1	Clinical Training OPT 5 to 8						100	100	50
AECC	Ability enhancement Compulsory Course – Environmental Science	80	20					100	50
SEC	Skill enhancement Course	80	20					100	50
SEC	Skill enhancement Course	80	20					100	50
GEC	Generic elective	80	20					100	50

For all elective course, 40 marks for university theory and Practical cum Viva examination & 10 marks as Internal Assessment = 50 marks which will be converted to 100 marks in the transcript.

PHYSICAL & GEOMETRICAL OPTICS AND PRINCIPLES OF LIGHTING

PAPER OPT 5: PHYSICAL OPTICS & GEOMETRICAL OPTICS AND PRINCIPLES OF LIGHTING

NAME OF THE SUBJECT	**: PHYSICAL & GEOMERTICAL OPTIC**
DURATION OF THEORY CLASSES	**: 80hrs**
DURATION OF TUTORIAL SESSIONS	**: 32hrs**
THEORY EXAMINATION	**: 100 marks (80 U+ 20IE)**
PRACTICAL EXAMINATION	**: NIL**
DURATION OF THEORY EXAMINATION	**: 3 Hrs**
YEAR IN WHICH THE SUBJECT PAPER IS TAUGHT	**: II YEAR**

COURSE DESCRIPTION

Physical Optics is the study of light, its properties and its interaction with matter. Specifically, the phenomena of interference, diffraction, polarization and scattering will be dealt with in detail. Geometric Optics is the study of light and its behavior as it propagates in a variety of media. Specifically, the phenomena of reflection and refraction of light at boundaries between media and subsequent image formation will be dealt with in detail.

OBJECTIVES

At the end of the course, the student will be able to:

- To equip the students with a thorough knowledge of mirrors and lenses.
- To predict the basic properties of the images for me dont heretina by the optics of the eye.
- To gain thorough knowledge of properties of light.
- To understand the distribution of light under various conditions.

PROGRAM OUTCOMES

OPT PO 1: Performs the duty as an Optometrist with leadership qualities having a good written & communication skills and also skilled at computer applications including E- library.

OPT PO 2: To gain knowledge about laboratory safety precautions, biomedical waste management adhering to the environmental needs of the society, and preventing the spread of infectious diseases.

OPT PO 3: Understanding the structure and functions of different organs in normal human body

OPT PO 4: To learn the general Biochemistry, Microbiology and Pathology, gaining expertise in Clinical Laboratory practices.

OPT PO 5: Be able to correct refractive errors and provide spectacle prescription

OPT PO 6: Be able to fit, evaluate, prescribe and dispense contact lenses for refractive errors and other ocular conditions

OPT PO 7: Be able to assess the low vision and provide comprehensive low vision care

OPT PO 8: Be able to have adequate knowledge to develop skill in manufacturing of spectacles, contact lenses and low vision devices.

OPT PO 9: Be able to do complete binocular vision assessment, manage non-strabismic Binocular vision anomalies and refer condition which warrants surgery

OPT PO 10: Be able to assess the visual demands for various occupations and match it to the visual capabilities. Also be able to advice on eye safety wear for various occupations.

OPT PO 11: Have knowledge and skill for early detection of various ocular conditions such as

glaucoma and its pharmacological treatment.
OPT PO 12: Have knowledge regarding organizations of eye banks and preservation of ocular tissues.
OPT PO 13: Have knowledge on sensory substitution and other rehabilitation measures for totally visually challenged. To identify various life style disorders and with due counselling & guidance advising the patients with proper diet, hygiene and Yoga to keep the body, mind, soul and behavior healthy.

COURSE OUTCOMES

PGO AHS CO 1: To equip the students with a thorough knowledge of mirrors and lens and predict the basic of the images formed on the retina by the optics of the eye.
PGO AHS CO 2: To make the students having the thorough knowledge of the distribution of light under various ocular conditions
PGO AHS CO 3: To make the students learn about the phenomenon of interference, diffraction, polarization and scattering of light.
PGO AHS CO 4: To understand the basic concept of image formation in convex and concave lenses.
PGO AHS CO 5: To learn the different types of refractive errors and their corrective measures. **PGO AHS CO 6:** To have a complete knowledge of the optical instruments, their principles and uses.
PGO AHS CO 7: To understand the properties, principle of types of lasers and their uses for the patients in Ophthalmology.
PGO AHS CO 8: To train the students in having thorough knowledge in writing the prescription of glasses in different forms.
PGO AHSCO9: To have complete knowledge in the phenomena of reflection in plane and spherical surfaces.
PGO AHS CO 10: To understand about refraction of light in plane, spherical, cylindrical and toric surfaces and their imaging properties

COURSE CONTENT

UNIT	TITLE	THEORY + TUTORIAL (80 + 32 HOURS)
I	**LIGHT , INTERFERENCE AND DIFFRACTIONS** • Modern theory • Visual task • Light &vision • Light sources • Lighting system designs • Photometry • Interference phenomena • Thomas young experiment • Newton‘s Ring experiment • Interferometer • Phenomenon • Fresnel‘s diffraction • Fraunhoffer diffraction • Applied aspects • Circular aperture	20 + 8
II	**POLARISATION, SPECTRUM, SCATTERING AND OPTICAL INSTRUMENTS** • Transverse waves • Double refraction • Nicole prism • Application &polarized light SPECTRUM • Sources of spectrum • Emission &absorption • Solar spectrum • UV & IRS pectrum • Electromagnetic Spectrum SCATTERING • Glare Effect • Photo Electric Effect • Raman Effect • Laser	18 + 6
	OPTICAL INSTRUMENTS • Spectrometer • Simple Compound Microscope • Telescope • Resolving Power of Optical instrument Eye	

III	**REFRACTION THROUGH SPHERICAL SURFACES** • Lens Introduction • Working of Spherical Lenses • Prism Diopter: Prentices Law • Refraction at Single Spherical Surfaces • Vergence • Thin Lens &Thick Lens • Vertex Power • Sphero-Cylindrical Lens • Writing Prescription in Different Forms	18 + 4
IV	**ABERRATION** • Chromatic • Spherical • Cylindrical • Coma • Prisms	10 + 5
V	**ERRORS OF REFRACTION** • Emmetropia & Ametropia • Myopia & Hypermetropia • Astigmatism • Presbyopia • Aphakia • Pseudophakia • Anisometropia & Aniseikonia • Amblyopia • Spectacle Magnification	10 + 5
VI	**LASERS** • Basic Laser Principles • Laser used in Ophthalmic Applications	4 + 4

METHODS OF TEACHING

1. Lecture cum discussion
2. Demonstration
3. Lab visit
4. Practical work record

METHODS OF EVALUATION

1. Written Test
2. Laboratory observation Book
3. Assignments
4. Oral Presentation

PRACTICAL EXERCISE

- Newton‘s Ring‘s radius of curvature – refractive index of lens
- Newton‘s Ring‘s – refractive index of liquid
- Air wedge- thickness of a wire(Hair)
- Grating- wave length determination
- Dispersive power of a grating
- Grating – minimum deviation & wavelength determination
- Reflection grating
- Diffraction at a straight wire
- Resolving power of a telescope
- Polarimeter
- Fresnel‘s biprism experience
- Thickness of thin glass plate
- Refraction through as lab
- Casuistic curve for a glass lab
- Refraction at a curved surface
- I-d curve for a prism – pinhole
- Spherometer and lens gauge
- Single optic lever
- Double optic lever
- Spherical mirrors
- Spherical lenses
- Critical angle – glass and water
- Magnifying power of a simple and a compound microscope
- Magnifying power of a telescope
- Spectrometer – minimum deviation
- Spectrometer-I-d curve
- Spectrometer – narrow angled prism
- Refractive index by microscope
- Foci meter
- Dispersive power of a prism
- Toric lens and meniscus lens
- Nodal slide
- Boy‘s method – radius of curvature
- Liquid lens
- Refractive index of lenses
- Power of concave and convex mirror

RECOMMENDED BOOKS

1. Principles of ophthalmic lenses –M.Jalie
2. Clinical optics – T.E.Fannin& T.Grosvenor
3. Theory and Practice of Optics and Refraction –A.K.Khurana
4. Principles and practice of Refraction and optics-N.C.Singhal
5. A Textbook of Optics - Brijlal, Avandhanulu & Subramaniyam

PAPER OPT 5: PHYSICAL OPTICS & GEOMETRICAL OPTICS AND PRINCIPLES OF LIGHTING – BLUE PRINT

Unit No	UNIT	WEIGHTAGE %	MARKS ALLOTED	LONG ANSWER QUESTIONS (10)	SHORT ANSWER QUESTIONS (6)	VERY SHORT ANSWER QUESTIONS (3)
I	Light, Interference and Diffraction	15%	12	1*	1	2
II	Polarisation, Spectrum, Scattering and Optical instruments	15%	12	1*	1	2
III	Refraction through spherical surfaces	20%	16	1	1	1*
IV	Aberrations, Prisms	7.5%	6		1*	2
V	Errors of Refraction	35%	28	1	2	2
VI	Laser	7.5%	6			2+1*

PAPER OPT 5: PHYSICAL OPTICS & GEOMETRICAL OPTICS AND PRINCIPLES OF LIGHTING

MODEL QUESTION PAPER

TIME: 3 Hrs **Max: 80 Marks**

Illustrate your answers with suitable diagrams wherever necessary.

A. LONG ANSWERS **(2X10=20)**

1. Different types of toric lenses and explain its geometrical optic system

(OR)

Define Accommodation Discuss In Detail the Anomalies of Accommodation

2. Write in detail about aberrations

(OR)

Write in detail about the Michelson Interferometer

B. ANSWER ANY FIVE OF THE FOLLOWING **(5x6=30)**

1. Explain hypermetropia
2. Explain about spectrometer.
3. Refraction about spherical lens
4. Define different types of interference of light.

5. Explain diffraction.

6. Draw the diagram to show what is meant by angle of deviation in a prism.

C.ANSWER ANY TEN OF THE FOLLOWING **(10X3 =30)**

1. Define light.

2. Polarized light.

3. Define UV and infrared rays.

4. Diverging lens.

5. Concave mirror.

6. Fresnel prism.

7. Spectrometer.

8. Anisikonia.

9. Spectacle magnification.

10. Diopter

11. Laser.

12. Principle of Laser.

OPTOMETRIC OPTICS

PAPER OPT 6: OPTOMETRIC OPTICS

NAME OF THE SUBJECT	**: OPTOMETRIC OPTICS**
DURATION OF THEORY CLASSES	**: 80 hrs**
DURATION OF TUTORIAL SESSIONS	**: 32 hrs**
UNIVERSITY THEORY EXAMINATION	**: 100 marks (80 U+ 20IE)**
UNIVERSITY PRACTICAL EXAMINATION	**: NIL**
DURATION OF THEORY EXAMINATION	**: 3 Hrs**
YEAR IN WHICH THE SUBJECT PAPER IS TAUGHT	**: II YEAR**

COURSE DESCRIPTION

This course deals with understanding the theory behind spectacle lenses and frames, their materials, types, advantages and disadvantages, calculations involved, when and how to prescribe. It will impart construction, design application and development of lenses, particularly of the methods of calculating their power and effect

OBJECTIVES

At the end of the course, the student will be able to:

- Measurement of lens power , lens centration using conventional techniques
- Transposition of various types of lenses
- Knowledge to identify different forms of lenses
- Knowledge to select the tool power for grinding process.
- Measurement of surface powers using lens measure.
- Method of laying off the lens for glazing process.

PROGRAM OUTCOMES (PO)

OPT PO 1: Performs the duty as an Optometrist with leadership qualities having a good written & communication skills and also skilled at computer applications including E-library.

OPT PO 2: To gain knowledge about laboratory safety precautions, biomedical waste management adhering to the environmental needs of the society, and preventing the spread of infectious diseases.

OPT PO 3: Understanding the structure and functions of different organs in normal human body

OPT PO 4: To learn the general Biochemistry, Microbiology and Pathology, gaining expertise in Clinical Laboratory practices.

OPT PO 5: Be able to correct refractive errors and provide spectacle prescription **OPT PO 6**: Be able to fit, evaluate, prescribe and dispense contact lenses for refractive errors and other ocular conditions

OPT PO 7: Be able to assess the low vision and provide comprehensive low vision care

OPT PO 8: Be able to have adequate knowledge to develop skill in manufacturing of spectacles, contact lenses and low vision devices.

OPT PO 9: Be able to do complete binocular vision assessment, manage non-strabismus. Binocular vision anomalies and refer condition which warrants surgery **OPT PO 10**: Be able to assess the visual demands for various occupations and match it to the

visual capabilities. Also be able to advice on eye safety wear for various occupations.
OPT PO 11: Have knowledge and skill for early detection of various ocular conditions such as glaucoma and its pharmacological treatment.
OPT PO 12: Have knowledge regarding organizations of eye banks and preservation of ocular tissues.
OPT PO 13: Have knowledge on sensory substitution and other rehabilitation measures for totally visually challenged. To identify various life style disorders and with due counseling & guidance advising the patients with proper diet, hygiene and Yoga to keep the body, mind, soul and behavior healthy.

COURSE OUTCOMES FOR OPTOMETRIC OPTICS

OP AHS CO1. Be able to do the measurement of lens power, lens centration using conventional techniques
OP AHS CO2. To do the transposition for various types of lenses and to identify different forms of lenses.
OP AHS CO3. To have the thorough knowledge for select the tool power for grinding process.
OP AHS CO4. To do the Measurement of surface powers used in lens manufacturing.
OP AHS CO5.To learn about the methods of laying off the lens for glazing process.
OP AHS CO6.To have ophthalmic prism knowledge, their effects, units, base-apex notation, compounding and resolving prisms
OP AHS CO7. To have the knowledge of prism and decent ration in ophthalmic lenses
OP AHS CO8.To learn about different types of materials used to make frames, lenses and its characteristics
OP AHS CO9. To learn various lens designs –single vision, bifocals, progressive lens
OP AHS CO10. To have the knowledge on tinted and protective lenses

COURSE CONTENT

UNIT	TITLE	THEORY + TUTORIAL (80+32) HOURS
I	**SPECTACLE LENSES** • Introduction • Spherical Lens • Cylindrical Lenses • Toric Lenses • Properties of cross cylinder • Transposition • Sag Formula • Vertex distance & Vertex Power • Manufacturing • Lens Quality	**25 + 5**

II	**OPHTHALMIC LENSES** • Prisms & unit & notation • Rotary Prism • Prismatic Effect	**15 + 5**
III	**SPECTACLE FRAME** • Types of frame and parts • Classification of frame • Frame Measurement & Marking	**10 + 2**
IV	**MONOFOCALLENS** • Crown Glasses • CR39 • CRHC • CRHMC • Polycarbonate	**15 + 10**
V	**MULTIFOCALLENSES** • K-Bifocals • D-Bifocals • E-Bifocals • Progressive Addition Lens(PAL) • Tinted & Protective Lenses • Polarizing Filters • Arc Lenses • Photochromic Lens • Mounting Of Ophthalmic Lens	**15 + 10**

METHODS OF TEACHING

1. Lecture cum discussion
2. Demonstration
3. Lab visit
4. Practical work record

METHODS OF EVALUATION

1. Written Test
2. Laboratory observation Book
3. Assignments
4. Oral Presentations

RECOMMENDED BOOKS

1. Principles of ophthalmic lenses –M.Jalie
2. Clinical optics – T.E.Fannin& T.Grosvenor
3. Theory and Practice of Optics and Refraction –A.K.Khurana
4. Principles and practice of Refraction and optics-N.C.Singhal

PAPER OPT-6: OPTOMETRIC OPTICS
BLUE PRINT

Unit No	UNIT	WEIGHTAGE%	MARKS ALLOTED	LONG ANSWER QUESTIONS (10)	SHORT ANSWER QUESTIONS (6)	VERY SHORT ANSWER QUESTIONS (3)
I	Spectacle lenses	26.25%	21	1*	2	3
II	Ophthalmic lenses	15%	12	1*	1	2
III	Spectacle frame	20%	16	1	1*	2+1*
IV	Mono focal lenses	15%	12		1	2
V	Multifocal lenses	23.75%	19	1	1	1+1 *

B.Sc. OPTOMETRY II YEAR PAPER
OPT-6: OPTOMETRICOPTICS
Model Question Paper

Time:3hrs **Max:80marks**

Illustrate your answer with suitable diagrams wherever necessary.

LONG ANSWER QUESTIONS **(2x10=20)**

1. a) Explain about faults on lens surface (OR)
   b) Detail about Vertex power and distance
2. a) Classify different types of multifocal(OR)
   b) Explain frames and its types

SHORT ANSWER ANY FIVE OF THE FOLLOWING **(5x6=30)**

1. Faults in spectacle lens
2. Explain the types of lens materials
3. Sag formula
4. Types of frame and materials
5. Types of bifocal
6. Pals

ANSWER ANY TEN OF THE FOLLOWING **(10X3=30)**

1. Lenticular lenses
2. Bridge
3. Spectacle frame materials
4. Bifocal
5. Cemented bifocal
6. Tinted lenses
7. Protective lenses
8. Base curve
9. Ghost image
10. Fresnel prism
11. Types of glazing
12. Vertex distance

OCULAR DISEASES

PAPER OPT-7: OCULAR DISEASES

DURATION OF THEORY CLASSES	**: 80HRS**
DURATION OF TUTORIAL SESSIONS	**: 32HRS**
THEORY EXAMINATION TOTAL MARKS	**: 100 (80U + 20IA)**
PRACTICAL EXAMINATION	**: NIL**
DURATION OF THEORY EXAMINATIONS	**: 3HRS**
YEAR IN WHICH SUBJECT PAPER TAUGHT	**: II YEAR**

COURSE DESCRIPTION

This course deals with various ocular diseases affecting various parts of the eyes. It covers clinical signs and symptoms, cause, pathophysiological mechanism, diagnostic approach, differential diagnosis and management aspects of the ocular diseases.

OBJECTIVES

1. At the end of the course the students will be knowledgeable in various ocular diseases.
2. They understand the Etiology, symptoms, signs and diagnosis of different parts of eyes such as Cornea, Conjunctiva, sclera, lens, Retina.

PROGRAM OUTCOMES

OPT PO 1: Performs the duty as an Optometrist with leadership qualities having a good written & communication skills and also skilled at computer applications including E- library.
OPT PO 2: To gain knowledge about laboratory safety precautions, biomedical waste management adhering to the environmental needs of the society, and preventing the spread of infectious diseases.
OPT PO 3: Understanding the structure and functions of different organs in normal human body **OPT PO 4**: To learn the general Biochemistry, Microbiology and Pathology, gaining expertise in Clinical Laboratory practices.
OPT PO 5: Be able to correct refractive errors and provide spectacle prescription
OPT PO 6: Be able to fit, evaluate, prescribe and dispense contact lenses for refractive errors and other ocular conditions
OPT PO 7: Be able to assess the low vision and provide comprehensive low vision care
OPT PO 8: Be able to have adequate knowledge to develop skill in manufacturing of spectacles, contact lenses and low vision devices.
OPT PO 9: Be able to do complete binocular vision assessment, manage non-strabismic Binocular vision anomalies and refer condition which warrants surgery
OPT PO 10: Be able to assess the visual demands for various occupations and match it to the visual capabilities. Also be able to advice on eye safety wear for various occupations.
OPT PO 11: Have knowledge and skill for early detection of various ocular conditions such as glaucoma and its pharmacological treatment.
OPT PO 12: Have knowledge regarding organizations of eye banks and preservation of ocular

tissues.

OPT PO 13: Have knowledge on sensory substitution and other rehabilitation measures for totally visually challenged. To identify various life style disorders and with due counselling & guidance advising the patients with proper diet, hygiene and Yoga to keep the body, mind, soul and behavior healthy.

COURSE OUTCOMES

ODAHS CO 1. Comprehend the normal disposition, inter-relationships, gross, functional and applied anatomy of various structures in the eye and adnexa.

OD AHS CO 2. Comprehend the basic structure and connections between the various parts of the central nervous system and the eye so as to understand the neural connections and distribution.

OD AHSCO3. Understand the normal functioning of all structures of the eye and their interactions

OD AHS CO 4. Elucidate the physiological aspects of normal growth and development of the eye and understand the phenomenon of vision.

OD AHS CO 5.Know the physiological principles underlying pathogenesis and treatment of diseases of the eye

OD AHS CO 6.Learn about the Etiology, symptoms, signs, Course sequelae of ocular disease, Diagnostic approach and management of the ocular structures such as Cornea , lens, sclera, conjunctival, retina, vitreous, orbit and eyelids.

OD AHS CO 7.Have the knowledge of Ocular Injuries, Terminology, Closed globe injury (contusion, lamellar laceration) Open globe injury (rupture, laceration, penetrating injury, perforating injury)

OD AHS CO 8.Learn about the Mechanical injuries (Extra ocular foreign body, blunt trauma, perforating injury, sympathetic ophthalmitis), Non Mechanical Injuries (Chemical injuries, Thermal, Electrical, Radiational)

OD AHS CO 9.Have the Clinical approach towards ocular injury patients and the hazards in their working environment.

OD AHS CO 10.Learn about the various ocular diseases of eye such as cataract, low vision, glaucoma, BSV anomalies, their preventive measures.

COURSE CONTENT

UNIT	TITLE	THEORY + TUTORIAL (80 + 32 HOURS)
I	**EYE LIDS, LACRIMAL SYSTEM AND CONJUNCTIVA & CORNEA** • External hordeolum & internal • Blepharitis & chalazion • Ectropion & Entropian • Trichiasis & Symblepharon • Lid Tumours & Ptosis • Lid Retraction & Trauma • Methods of Lacrimal Evaluation • Congenital & developmental Anomalies • Congential Dacryo Cystitis & Chronic Dacryo Cystitis • Conjuctivitis (Infective) • Conjuctivitis (Non-Infective) • Conjuctivitis (Miscellaneous) • Types of Corneal Ulcers and Complications • Grades of Corneal Opacity • Herpes Zoster • Photophthalmia • Corneal Dystrophy • Corneal Injury	**20 + 6**
II	**SCLERA,EPISCLERA, ORBIT & UVEAL TRACT** • Inflammation of Episclera • Proptosis • Exophthalmos • Enophthalmos • Iripocyclitis, Iris Bombe, Synechiae • Aqueous Flare • RAPD • Festooned Pupil • Iridodyalisis • Uveitis	**18 + 6**

III	**VITREOUS, LENS and RETNIA** • Floaters • Haemorrhage • VIT–Detachments • Congenital Developmental Cataract • Types Of Cataract (Aquires & Congenital) • Stages, Symptoms, Signs & Management • Hypertensive & Diabetic Retinopathies • CSR • CME • RP • RD • Retinal Hole & Detachment • ARMD • CRVO & CRAO • C/D ratio	**18 + 8**
IV	**NEUROOPHTHALMOLOGY** • Visual Function • Pupillary Examination • Ocular Motility • Strabismus & Nystagmus • Visual Field Defects • Vergence System • Non-Visual Reflex System • Visual Sensory system	**10 + 6**
V	**OCULAR TRAUMA** • Anterior and Posterior Segment Trauma • Blunt and perforated injury • Blindness Definition(WHO) • Causes for Blindness • Drug induced Ocular Diseases	**14 + 6**

METHODS OF TEACHING

1. Lecture cum discussion
2. Demonstration
3. Lab visit
4. Practical work record

METHODS OF EVALUATION

1. Written Test
2. Laboratory observation Book
3. Assignments
4. Oral Presentations

RECOMMENDED BOOKS

- Comprehensive ophthalmology – A.K. Khurana
- Basic Ophthalmology –RenuJogi
- Practical Retinal OCT-Lumroso
- Handbook of optometry and eye disorders-Nathan

BLUE PRINT

Unit No	UNIT	WEIGHTAGE %	MARKS ALLOTED	LONG ANSWER QUESTIONS (10)	SHORT ANSWER QUESTIONS (6)	VERY SHORT ANSWER QUESTIONS (3)
I	EYE LIDS, LACRIMAL SYSTEM AND CONJUNCTIVA& CORNEA	31.25%	25	1	1	3
II	SCLERA, EPISCLERA, ORBIT & UVEAL TRACT	15%	12		1	2+1*
III	VITREOUS, LENS&RETNIA	27.5%	22	1	1+1*	2
IV	NEUROOPHTHALMOLOGY	11.25%	9	1*	1	1+1*
V	OCULAR TRAUMA	15%	12	1*	1	2

PAPER OPT-7 :- OCULAR DISEASES

MODEL QUESTION PAPER

TIME: 3hrs **Max: 80 marks**

Illustrate your answer with suitable diagrams wherever necessary.

(A) LONG ANSWER QUESTIONS **(2x10=20)**

1. a) Explain classification of cataract and its management.(OR)
   b) Detail about Retinal detachment
2. a) Explain the types of corneal ulcer, symptoms, signs & treatments.(OR)
   b) Explain about blunt Injury.

(B) SHORT ANSWER ANY FIVE OF THE FOLLOWING **(5x6=30)**

1. Dacryocystitis and its types with management as well
2. Diabetic retinopathy
3. Iridocyclitis
4. Mention four causes of vitreous hemorrhage
5. Optic atrophy

6. Corneal dystrophies

B. VERY SHORT ANSWER ANY TEN OF THE FOLLOWING (10X3=30)

1. Ecrtopion
2. Chalazion
3. Scleritis
4. Episcleritis
5. Exopthalmos
6. Panopthalmitis
7. Vitreous hemorrhage
8. Siderosis bulbi
9. Vossius ring
10. Opthalmia neonatarum
11. Lagophthalmus
12. Keratomalacia

VISUAL OPTICS, OPTOMETRIC INSTRUMENTATION & EXAMINATION OF THE VISUAL SYSTEM

PAPER OPT-8:- VISUAL OPTICS, OPTOMETRIC INSTRUMENTATION & EXAMINATION OF THE VISUAL SYSTEM

DURATION OF THEORY CLASSES	**: 64 HRS**
DURATION OF PRACTICAL SESSIONS	**: 64 HRS**
EXAMINATION THEORY MARKS	**: 100 (80U + 20IA)**
EXAMINATION PRACTICAL MARKS	**: 100**
MARKS DURATION OF THEORY EXAMINATIONS	**: 3 HRS**
SUBJECT PAPER TAUGHT IN	**: II YEAR**

COURSE DESCRIPTION

This course deals with the concept of eye as an optical instrument and thereby covers different optical components of eye, types of refractive errors, clinical approach in diagnosis and management of various types of refractive errors.

OBJECTIVES

At the end of the course, the student will be able to:

- To understand the fundamentals of optical components of the eye
- To gain theoretical knowledge and practical skill on visual acuity measurement, objective and subjective clinical refraction.

PROGRAM OUTCOMES

OPT PO 1: Performs the duty as an Optometrist with leadership qualities having a good written & communication skills and also skilled at computer applications including E- library.
OPT PO 2: To gain knowledge about laboratory safety precautions, biomedical waste management adhering to the environmental needs of the society, and preventing the spread of infectious diseases.
OPT PO 3: Understanding the structure and functions of different organs in normal human body **OPT PO 4**:To learn the general Biochemistry, Microbiology and Pathology, gaining expertise in Clinical Laboratory practices.
OPT PO 5:Be able to correct refractive errors and provide spectacle prescription
OPT PO 6: Be able to fit, evaluate, prescribe and dispense contact lenses for refractive errors and other ocular conditions
OPT PO 7: Be able to assess the low vision and provide comprehensive low vision care
OPT PO 8:Be able to have adequate knowledge to develop skill in manufacturing of spectacles, contact lenses and low vision devices.
OPT PO 9: Be able to do complete binocular vision assessment, manage non-strabismic Binocular vision anomalies and refer condition which warrants surgery
OPT PO 10: Be able to assess the visual demands for various occupations and match it to the visual capabilities. Also be able to advice on eye safety wear for various occupations.
OPT PO 11: Have knowledge and skill for early detection of various ocular conditions such as

glaucoma and its pharmacological treatment.
OPT PO 12: Have knowledge regarding organizations of eye banks and preservation of ocular tissues.
OPT PO 13: Have knowledge on sensory substitution and other rehabilitation measures for totally visually challenged. To identify various life style disorders and with due counselling & guidance advising the patients with proper diet, hygiene and Yoga to keep the body, mind, soul and behavior healthy.

COURSE OUTCOME

VO AHS CO 1.To know about various optical components of eye, types of refractive errors, clinical approach.
VO AHS CO 2.To know the diagnosis and management of various types of refractive errors.
VO AHS CO 3. To understand the fundamentals of optical components of the eye
VO AHS CO 4. To gain theoretical knowledge and practical skill on visual acuity measurement, objective and subjective clinical refraction.
VO AHS CO 5.To learn about commonly used optometric instruments like retinoscope, tonometry, lensometer, perimeter its basic principle, description and usage in clinical practice.
VO AHS CO 6.To have complete knowledge about the types, advantages and disadvantages of various optometric instruments like Direct ophthalmoscope, Slit lamp Biomicroscope, keratometer.
VO AHS CO 7.To learn about various refractive anamolies, their evaluation techniques and correction of errors.
VO AHS CO 8.To have knowledge of A scan biometry in IOL power calculations for extraction of cataract.
VO AHS CO 9.To learn about the optics of ocular structures of eye such as cornea, lens, aqeous and vitreous.
VO AHS CO 10. To learn about the optical constants of eye.

COURSE CONTENT

UNIT	TITLE	THEORY (64 HOURS)
I	**REVIEW OF GEOMETRIC OPTICS** • Vergence • Sign Convention • Spherical & cylindrical Refracting Surface • Cardinal Points • Magnification **OPTICS OF OCULAR STRUCTURES** • Cornea & Aqueous • Crystalline lens • Vitreous • Axial & axis of the eye	**15**

II	**MEASUREMENT OF OPTICAL CONSTANTS** • Cornea Curvature • Keratometry • Curvature of lens **RERACTIVE ANOMALIES & CAUSES** • Aetiology • Contributing and populating • Optical components • Growth of eye relation to refractive errors **REFRACTIVE CONDITIONS** • Emmetropia, myopia and hypermetropia • Astigmatism, anisometropia and aniseikonia • Aphakia & Pseudophakia, Presbyopia & correction **NPA & NPC** • AC/ARATIO	**15**
III	**RETINOSCOPY** • Principle & methods • Dynamic & Static • Astigmatic fantest • Complications of retinoscopy • Speed of retinal reflex and condition	**14**
IV	**EFFECTIVE POWER OF SPECTACLES** • Vertex distance • Retinal image • Depth of focus and field	**4**
V	**SPECTACLE MAGNIFICATION** • Spectacle magnification • Relative spectacle magnification	**2**
VI	**OPTOMETRIC INSTRUMENTATION** • Standard test chart, Trial case, Trial lenses, Trial Frame Accessories • Refractor (Phropter) Auto Refractometer, Retinoscope • Projection Chart, Illumination &Refraction chamber • Pupilometer, BAT,VAT,NFA • Topography, Surface Regularity, Auto Keratometer, Haploscope • Pleoptics ,Synoptophore, Perimeter(Auto) • Analyzing the visual field defects , Goldman Perimeter &HFA • Scan Biometry ,Pachymetry , Scan ,UBM, OCT,ERG,VEP,EOG	**14**

PRACTICAL- VISUAL OPTICS (64HOURS)

- Study of Purkinje images I and II
- Study of Purkinje images III and IV
- Measurement of corneal curvature
- Measurement of corneal thickness
- Mathematical models of the eye–Emmetropia
- Mathematical models of hypermetropia
- Mathematical models of myopia
- Conjugate points – demonstration- worked examples
- Axial and refractive hyperopic
- Axial and refractive myopia – worked examples
- Visual acuity charts
- Effect of lenses in front of the eye
- Effect of prism in front of the eye
- Vision through pinhole, slit, filters, etc.
- Photometry
- Visual acuity, streo acuity in emmetropics
- Myopia and pseudo myopia, myopia and visual acuity
- Hypermetropia – determination of manifest error subjectively
- Hypermetropia correction: Subjective verification
- Demonstration of Astigmatism. Use of silt and kertometry to find the principal meridians
- Astigmatism: fan – subjective verification tests
- Astigmatism: cross – cyl. – subjective verification test
- Measurements of accommodation: near and far points and range
- Presbyopic correction and methods : accommodation reserve , balancing the relative accommodation and cross grid test
- Methods of Retinoscopy-Emmetropia
- Methods of Retinoscopy – Spherical ametropia
- Methods of Retinoscopy –Simple astigmatism
- Methods of Retinoscopy –Compound hyperopia
- Methods of Retinoscopy –Compound myopia
- Methods of Retinoscopy –Oblique astigmatism
- Methods of Retinoscopy - in media opacities
- Methods of Retinoscopy - in irregular astigmatism
- Methods of Retinoscopy - in strabismus and eccentric fixation
- Interpretation of cycloplegic retinoscopic findings
- Prescription writing
- Binocular refraction
- Photo refraction
- Vision therapy
- Exercises for vergence

METHODS OF TEACHING

a. Lecture cum discussion
b. Demonstration
c. Lab visit
d. Practical work record

METHODS OF EVALUATION

a. Written Test
b. Laboratory observation Book
c. Assignments
d. Oral Presentation

RECOMMENDED BOOKS

1. Principles of ophthalmic lenses –M.Jalie
2. Clinical optics – T.E.Fannin& T.Grosvenor
3.Theory and Practice of Optics and Refraction – A.K.Khurana
4.Principles and practice of Refraction and optics-N.C.Singhal

BLUE PRINT

Unit No	UNIT	WEIGHTAGE %	MARKS ALLOTED	LONG ANSWER QUESTIONS (10)	SHORT ANSWER QUESTIONS (6)	VERY SHORT ANSWER QUESTIONS (3)
I	REVIEW OF OPTOMETRIC OPTICS,OPTICS OF OCULAR STRUCTURE	3.75%	3			1+1*
II	MEAUSREMENT OF OPTICAL COMPONENTS,NPC AND ANPA,REFRACTIVE ANAMOLIES	15%	12	1*	1+1*	2
III	RETINOSCOPY	35%	28	1	2	2
IV	EFFECTIVE POWER OF SPECTACLES	3.75%	3			1+1*
V	SPECTACLE MAGNIFICATION	7.5%	6			2
VI	OPTOMETRIC INSTRUMENTATION	35%	28	1+1*	2	2

PAPER OPT-8: VISUAL OPTICS, OPTOMETRIC INSTRUMENTATION & EXAMINATION OF THE VISUAL SYSTEM

MODEL QUESTION PAPER

TIME: 3HRS **Max:80 Marks**

Illustrate your answer with suitable diagrams wherever necessary.

A.LONG ANSWER QUESTION **(2x10=20)**

1. a)Explain retinoscopy refraction(OR)
   b) Explain principles of stigmatism
2. a) Explain hypermetropia (OR)
   b) Explain the Principles and uses of lensometer.

B. SHORT ANSWER ANY 5 OF THE FOLLOWING: **(5x6=30)**

1. Write the uses, principle, working of keratometry.
2. Explain hypermetropia and myopia.
3. Dynamic retinoscopy and static retinoscopy.
4. Ascan biometry.
5. Pachymetry/OCT.
6. Slit lamp.

C. ANSWER ANY TEN OF THE FOLLOWING: **(10X2=20)**

1. Sign convention.
2. Explain corneal curvature.
3. Presbyopia and its correction.
4. RAF ruler.
5. Phropter.
6. Optical components.
7. Vertex distance and power.
8. Spectacle magnification.
9. Define Autoperimeter.
10. Types of Tonometer.
11. Uses of Applanation Tonometer.
12. Define Normal fundus.

II YEAR ELECTIVE COURSES

II YEAR ELECTIVE COURSE CONTENT ABILITY ENHANCEMENT COMPULSORY COURSE (AECC) ENVIRONMENTAL STUDIES

NAME OF THE SUBJECT PAPER	**: ENVIRONMENTAL STUDIES**
DURATION OF THEORY CLASSES	**: 16 hrs**
DURATION OF PRACTICAL SESSIONS	**: 32 hrs**
EXAMINATION	**: 100 marks (80 U + 20IA)**
NO UNIVERSITY PRACTICAL EXAMINATION	
DURATION OF THEORY EXAMINATION	**: 1 ½ hrs**
YEAR IN WHICH THE SUBJECT PAPER IS TAUGHT	**: IIYEAR**

SYLLABUS

UNIT-I (Renewable and Non — renewable resources**)**

The multidisciplinary nature of environmental studies — Definition, scope and importance — Need for public awareness.

1 Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people.
2 Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems.
3 Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies.
4 Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.
5 Energy resources: Growing energy needs, renewable and non-renewable energy resources, use of alternate energy sources, case studies.
6 Land resources: Land as a resource, land degradation, man induced Landslides, soil erosion and desertification. Role of an individual in conservation of natural resources. Equitable use of resources for sustainable lifestyles.

UNIT-II (Ecosystems)

Concept of an ecosystem - Structure and function of an ecosystem Producers, consumers and decomposers — Energy flow in the ecosystem-Ecological succession-Food chains, food webs and ecological pyramids —Introduction, types, characteristic features, structure and function of the following ecosystem:

- Forest ecosystem
- Grassland ecosystem
- Desert ecosystem
- Aquatic ecosystems (Ponds, streams, lakes, rivers, ocean estuaries)

UNIT-III (Biodiversity and its conservation)

Introduction — Definition: genetics, species and ecosystem diversity

- Biogeographically classification of India
- Value of Biodiversity: Consumptive use, productive use, social, Ethical aesthetic and option values
- Biodiversity at global, national and local levels
- India as a mega- diversity nation
- Hot-spots of biodiversity-Threats to biodiversity: habitat loss, poaching of wildlife, man wildlife conflicts

- Endangered and endemic species of India
- Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity

UNIT-IV (Environmental Pollution)

Definition- causes, effects and control measures of:

- Air pollution
- Water pollution
- Soil pollution
- Marine pollution
- Noise pollution
- Thermal pollution
- Nuclear pollution
- Solid waste Management: causes, effects and control measures of urban

and industrial wastes — role of an individual in prevention of pollution — Pollution case studies — Disaster management: floods, earthquake, cyclone and landslides.

UNIT-V

Social Issues and the Environment: From unsustainable to sustainable development — Urban problems and related to energy — Water conservation, rain water harvesting, watershed management —Resettlement and rehabilitation of people; its problems and concerns. Case studies - Environmental ethics: issues and possible solutions climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust.

- Wasteland reclamation — Consumerism and waste products — Environmental Protection Act — Air (Prevention and Control of Pollution) Act — Water (Prevention and control of Pollution) Act — Wildlife Protection Act — Forest Conservation Act - Issues involved in enforcement environmental legislation — Public awareness
- Human Population and the Environment: Population growth, variation among nations — Population explosion — Family welfare Programmes —Environment and human health- Human Rights - Value Education- HIV/ AIDS - Women and Child Welfare- Role of Information Technology in Environment and Human Health — Case Studies.

FIELD WORK

1. Visit to local area to document environmental assets- river/ forest/ grassland /hill / mountain
2. Visit to a local polluted site - Urban / Rural / Industrial /Agricultural
3. Study of common plants, insects, birds
4. Study of simple ecosystems- pond, river, hill slopes, etc.

TEXT BOOKS RECOMMENDED

1. Agarwal, K.C. Environmental Science, Nidi Publishers.
2. BharuchaErach, The Biodiversity of India, Mapin Publication.
3. Brunner RC, Hazardous waste incineration, McGraw Hill Publishers.
4. Iaclhav H, Environmental Protection and Laws, Himalaya Publication.
5. Odum EP, fundamentals of Ecology, WB Sannders Publication.

TEACHING LEARNING ACTIVITIES

The course content in Environmental Studies will be covered by:

1. Interactive Lectures
2. Group Discussions
3. Field Visits

SKILL- BASED ELECTIVE COURSES – II YEAR GOOD CLINICAL LABORATORY PRACTICE

NAME OF THE SUBJECT PAPER	**: Good Clinical Laboratory practice**
DURATION OF THEORY CLASSES	**: 16 Hrs**
DURATION OF PRACTICAL SESSIONS	**: 32 Hrs**
PRACTICAL EXAMINATION	**: 50 Marks (40 U + 10IA)**
NO UNIVERSITY THEORY EXAMINATION	
DURATION OF EXAMINATION	**: 1 ½ Hrs**
YEAR IN WHICH THE SUBJECT PAPER IS TAUGHT	**: II YEAR**

THEORY & PRACTICALS (DURATION 16 + 32 Hours)

Learning Objective

- To understand the relevance, importance and basic concepts of good laboratory practices
- To apply the knowledge to become familiar with the basic laboratory skills

UNIT I: INTRODUCTION

Introduction to Bioethics and Biosafety. Biosafety Guidelines and Regulations. Legal and Socio-economic Impacts of Biotechnology. Use of Genetically Modified Organisms and their Release in the Environment. Hazardous Materials used in Biotechnology their Handling and Disposal.

UNIT II: GOOD LABORATORY PRACTICE PRINCIPLE

Test Facility Organization and Personnel: Management responsibility, Study directors responsibility, safety measures and personal responsibility. Quality assurance program. Facilities: Test System Facilities, Facilities for Handling test and Reference Substances. Archive Facilities. Waste Disposal, Animal Care Facilities, Animal Supply Facilities.

UNIT III: STANDARDED OPERATING PROCEDURES

Definition, Initiation of SOP, Preparation of SOP, Administration, Distribution and Implementation. Maintenance of laboratory records. Formatting SOP, Reagent/materials certification, Certification of analysts, Certification of laboratory facilities, Documentation and maintenance of record.

UNIT IV: DATE REPORTING AND STORAGE

Performance of study, Study plan, Conduct of study, Reporting of results. Archival storage of records and reports.

Learning Outcome

- To understand the implications of good laboratory practices

SKILL- BASED ELECTIVE COURSES – II YEAR
COMPUTER APPLICATIONS

NAME OF THE SUBJECT PAPER : COMPUTER APPLICATIONS

DURATION OF THEORY CLASSES : 16Hrs

DURATION OF PRACTICAL SESSIONS : 32Hrs

PRACTICAL EXAMINATION : 50 Marks (40 U + 10 IA)

NO UNIVERSITY THEORY EXAMINATION

DURATION OF EXAMINATION : 1 ½ Hrs

YEAR IN WHICH THE SUBJECT PAPER IS TAUGHT : II YEAR

THEORY & PRACTICALS (DURATION 16 + 32 Hours)

UNIT - I - Introduction to Computers

- Concepts of Computers
- Hardware and software trends and technology
- Classification of computers
- Application of computers in Laboratories

UNIT - II - Operating System

- Introduction
- Types of operating systems
- Windows

UNIT - III -Multimedia

- Types and uses
- Computer aided teaching and testing

UNIT — IV -Internet

- Introduction to Internet
- Use of Internet and e-mail
- Statistical packages

LIST OF PRACTICAL EXERCISES

1. Computer operating systems like MS~DOS and WINDOWS
2. Study of software packages like Chem Draw, Tinker and Microsoft package. Unit - Typing text in MS word- manipulating text- formatting the text – using different font sizes, bold, italics, Bullets and numbering – pictures, file insertion – aligning the text and justify – choosing paper size – adjusting margins- header and footer, inserting page numbers in a document – printing a file with options – using spell check and grammar – find and replace mail merge – inserting tables in a document.

Creating table in MS - Excel – cell editing – using formulas and functions – manipulating data with excel – using sort function to sort numbers and alphabets – drawing graphs and charts using data in excel – auto formatting – inserting data from other worksheets Preparing new slides using MS- POWER POINT – inserting slides – slide transition and animation – using templates – different text and font sizes – slides with sounds – inserting clip arts, pictures, tables and graphs – presentation using wizards.

Internet- using search engine – Google search – Exploring the text Explorer and Navigator – uploading and downloading of files and images E mail ID creation – sending messages – attaching files in E-mail

TEACHING LEARNING ACTIVITIES

The course content in Computer Applications will be covered by:

1. Interactive Lectures
2. Lab

SKILL- BASED ELECTIVE COURSES – II YEAR
Library and E-resource

NAME OF THE SUBJECT PAPER	**: Library and E-resource**
DURATION OF THEORY CLASSES	**: 16 Hrs**
DURATION OF PRACTICAL SESSIONS	**: 32 Hrs**
PRACTICAL EXAMINATION	**: 50 Marks (40 U + 10IA)**
NO UNIVERSITY THEORY EXAMINATION	
DURATION OF EXAMINATION	**: 1 ½ Hrs**
YEAR IN WHICH THE SUBJECT PAPER IS TAUGHT	**: II YEAR**

THEORY & PRACTICALS (DURATION 16 + 32 HOURS)

Course Objectives

- To enable the students to understand at different levels of information systems in the society and their functions.
- To enable the students apply their knowledge in various library practice.
- To enable the students to understand the basic concepts of the Health Sciences.

UNIT: 1

Evolution, growth and development of LIS in India-current trends.
Type of libraries: Academic, Public and special Libraries (Health Science Libraries).

UNIT: 2
Library concepts & Legislation: Five laws of Library science, Professional ethics of librarian, Delivery of books and newspaper act/Intellectual Property/Plagiarism.

UNIT: 3
Library Association and International Bodies: Library Association –ILA, IASCIC, ALA, IFLA and UNESCO, SALIS, MLAI (Medical Library Association of India).

UNIT: 4
Library Rules & amp; Regulation, Stock Verification, Annual Reports, Budgets, Library buildings, furniture, equipment‘s.

SKILL- BASED ELECTIVE COURSES – II YEAR
PUBLIC HEALTH AND HYGIENE

NAME OF THE SUBJECT PAPER	**: Public Health and Hygiene**
DURATION OF THEORY CLASSES	**: 16Hrs**
DURATION OF PRACTICAL SESSIONS	**: 32Hrs**
PRACTICAL EXAMINATION	**: 50 Marks (40 U + 10IA)**
NO UNIVERSITY THEORY EXAMINATION	
DURATION OF EXAMINATION	**: 1 ½ Hrs**
YEAR IN WHICH THE SUBJECT PAPER IS TAUGHT	**: II YEAR**

THEORY & PRACTICALS (DURATION 16 + 32 Hours)

Learning objectives

- To understand the concepts, significance and relevance of public health and hygiene
- To understand the health hazards as associated with public health and hygiene

I Introduction
Definition and Concept of Public Health, historical aspects, public health system in India and in the rest of world

II Aspects of health
Indicators of health, Determinants of Health, (Social, Economic, Cultural, Environmental, Education, Genetics, Food and Nutrition).Burden and prevention of disease. Environmental health- sanitation, air, water pollution, waste management. Mental health.

III Epidemology

Introduction, principles and concepts, study design, analysis methods, presentation and interpretation of epidemiological data

IV Hygieneconcepts

Definition, importance, personal hygiene, medical hygiene, food hygiene, industrial hygiene.

Learning outcomes

- To understand public health and hygiene issues, their relevance and significance as can be practiced in real-life situations.

Text Books

1. Introduction to Public Health, Raymond L. Goldsteen, Karen Goldsteen, David G. Graham, 2011, Springer publishing company
2. Introduction To Community Health Nursing, Kasturi SundarRao, 4th edition, Bi Publications PvtLtd
3. Concepts of Epidemiology, Raj S Bhopal, 2002, Oxford University press

Reference Books

1. A Treatise On Hygiene And Public Health, Birendra Nath Ghosh, 9th edition, Calcutta Scientific Publishing Co
2. An Introduction to Public Health, Caryl Thomas, 1949, John Wright and SonsLtd.,

GENERIC ELECTIVE COURSES – II YEAR
BASIC PSYCHOLOGY

NAME OF THE SUBJECT PAPER : Basic Psychology

DURATION OF THEORY CLASSES : 64 Hrs

PRACTICAL EXAMINATION : 50 Marks (40 U + 10 IA)

NO UNIVERSITY THEORY EXAMINATION

DURATION OF EXAMINATION : 1 ½ Hrs

YEAR IN WHICH THE SUBJECT PAPER IS TAUGHT : II YEAR

THEORY (64 Hours)

LEARNING OBJECTIVES

After complete ting the course the student can able to

- To identify the emerging specialties
- To understand the behavior and mental processes
- How the theories and principles of psychology may be applied toi ndividual, societal and global issue
- Explain the application of psychology in Allied Health Sciences

Unit I: Introduction

Introduction to applied Psychology, Scientific methods in Psychology, Application of Psychology: Psychology in Industry, community, family, education, health, self development, Human relations. Scope of psychology with special relevance to Allied Health Sciences.

Unit II: various cognitive processes and their application

Factors affecting learning, Importance of studying Psychology of learning in relation to Allied Health Sciences

Memory and forgetting, Kinds of remembering, the nature of forgetting, Improving memory, relevance to Allied Health Sciences

Intelligence, Normal distribution of intelligence levels, Intelligence Testing, Intelligence tests, Uses and abuses of intelligence tests, relevance of intelligence and aptitude for Allied Health Sciences

Unit-III: Life style, Health, Stress and Coping Behavior

Cultural evolution, Life style choices and consequences, Healthy and Unhealthy life styles.Nutrition, Physical fitness, Smoking and Drinking. Stress and Health, The biological basis of stress, Stress and Physical functioning, Coping with stress, Adjustment a lifelong process. Cognitive appraisal and Stress, Stressful life styles,

Coping with everyday stress, Sources of stress, Coping styles and Strategies, Stress inoculation training.

Unit IV : Psychology of Vulnerable Individuals

Psychology of the challenged, types of disability, effects of disability, psychology of women, women and health, dealing with alcoholics and their families, post-traumatic stress disorder, psychology of the sick and ill, how patients react to chronic illness, effects of illness and hospitalization

REFERENCE BOOKS

1. Clifford T. Morgan, Richard a. King, John R. Weis and John Schopler, —Introduction to Psychology‖ – 7th Edition. Tata McGraw Hill Book Co. New Delhi,1993.

2. Ernest R. Hillgard, Richard C. Atkinson, Rita L. Atkinson, —Introductionto Psychology‖6thEdition,OxfordIBHpublishingCo.Pvt.Ltd.,NewDelhi,1975.

3. Baron.A. Robert, Psychology, Pearson Education VthEd.,2002

4. Psychology –the science of behavior –fifth edition1982-Neil Carson-William Bulkist- Allyn andBacon.

GENERIC ELECTIVE COURSES – II YEAR SOCIOLOGY

NAME OF THE SUBJECT PAPER	**: SOCIOLOGY**
DURATION OF THEORY CLASSES	**: 64 Hrs**
EXAMINATION	**: 50 Marks (40 U + 10IA)**
NO UNIVERSITY PRACTICAL EXAMINATION	
DURATION OF THEORY EXAMINATION	**: 1 ½ Hrs**
YEAR IN WHICH THE SUBJECT PAPER IS TAUGHT	**: II YEAR**

THEORY (64 Hours)

Unit 1: Sociology: Discipline and Perspective

- Thinking Sociologically
- Emergence of Sociology, Sociology as a science; Sociology and Common Sense
- Some Basic concepts: Association; Aggregates: Community, Categories, Groups and its Forms; Status and Role; Norms and Values.
- Individual and Society; Socialization: Concept and Agencies; Culture – meaning and characteristics; Types of culture – popular, elitist, folk, and consumer cultures; Pluralism and Multiculturalism, Culture and Personality.

Unit 2: Sociology and Other Social Sciences

- Sociology and Social Anthropology
- Sociology & Psychology
- Sociology & History

Unit 3: Human Society

- Social Institutions and Social Processes
- Social control: meaning, agencies and mechanisms
- Conformity and Deviance.
- Social Change, definition, factors, Social Mobility Readings

1. Anthony Giddens :Sociology
2. G. Rocher: A General Introduction to Sociology
3. George Ritzer. Encyclopaedia of sociology
4. Harry M. Johnson Sociology

GENERIC ELECTIVE COURSES – II YEAR
ENTREPRENEURSHIP ESSENTIALS

NAME OF THE SUBJECT PAPER	**: Entrepreneurship essentials**
DURATION OF THEORY CLASSES	**: 64Hrs**
EXAMINATION	**: 50 Marks (40 U + 10 IA)**
NO UNIVERSITY PRACTICAL EXAMINATION	
DURATION OF THEORY EXAMINATION	**: 1 ½ Hrs**
YEAR IN WHICH THE SUBJECT PAPER IS TAUGHT	**: II YEAR**

THEORY (64 Hours)

LEARNING OBJECTIVES

- To understand the fit between you and your entrepreneuriall ambitions
- To find a problem worth solving
- To identify your customers
- To develop a solution for your customers' problems and problem solution
- To build and demonstrate an MVP
- Tostructureabusinessmodelaroundtheproblem,customer,andsolutionand present your Business Model Canvas

UNIT – I ORIENTATION

What is entrepreneurship – myths about entrepreneurship – impact of an entrepreneur and social entrepreneurship – wealth building and making an impact

IDEA/PROBLEM

What is a business opportunity and how to identify it - Methods for finding and understanding problems - (Observation, Questioning, DT, Jobs to be done (JTBD) - Introduction to Design Thinking - Process and Examples - Generate ideas that are potential solutions to the problem identified.

UNIT - II CUSTOMER

The difference between a consumer and a customer (decision maker); Market Types, Segmentation and Targeting, Defining the personas; Understanding Early Adopters and Customer Adoption Patterns - Identify the innovators and early adopters for start-up - Basics of Lean Approach and Canvas; Types of Business Models (b2b; b2c)

UNIT – III

BUSINESS MODEL AND VALIDATION

Introduction to Risks; Identify and document your assumptions (Hypotheses); Identify the riskiest parts of Plan - Develop the Solution Demo - Sizing the Opportunity - Building an MVP (Minimum Viable Product)

UNIT – IV

MONEY AND TEAM

Revenue Streams: Basics of how companies make money - Understand income, costs, gross and net margins - Identify primary and secondary revenue streams - Pricing and Costs - Financing Your New Venture - Team Building: Role of a good team in a venture's success; What to look for in a team; How do you ensure there is a good fit? Defining clear roles and responsibilities

UNIT – V

MARKETING AND SALES

Positioning – channels and strategy – sales planning – Importance of project management to launch and track progress - Understanding time management, workflow, and delegation of tasks– Business regulation: Basics of business regulations of starting and operating a business - Importance of being compliant and keeping proper documentation

LEARNING OUTCOMES

- This course will give the students the foundational experience of the entire cycle of entrepreneurship, through a combination of theory and practice.
- Students will learn what it takes to be an entrepreneur, recognizing business opportunities and the basics to create launch and manage new businesses.
- The participating students will create a ‗campus venture' or a "real" venture of their own to practice the concepts taught during the program. The course is built in a modular fashion such that colleges can tailor their offerings to cover either the entire offering (idea to an MVP) or limit to building a business model.

III YEAR

B.Sc - OPTOMETRY

FACULTY OF ALLIED HEALTH SCIENCES SRI BALAJI VIDYAPEETH

(Deemed to be University)

Accredited by NAAC with 'A' Grade

III YEAR

CORE SUBJECTS

1. Binocular Vision & Contact Lens
2. Glaucoma &Cataract
3. Low Vision Aids & Dispensing Optics
4. Law and Optometry

Discipline Elective Course (DEC) – Choose any TWO

1. Biomedical Waste Management
2. Eye banking
3. Community Optometry
4. Visual diagnostic for children with special needs
5. Ocular Pharmacology

AHS COURSE CONTENT THIRD YEAR B.SC. OPTOMETRY (OPT)

Faculty code	Category	Course title	Hours					Credits				
AHS	Core theory OPT	Subjects	Theory	Practical	Tutorials	Clinical training	Total hours	Lecture	Practical	Tutorials	Clinical training	Total credits
AHS	OPT -9	Binocular Vision & Contact Lens	80		32			5		1		6
AHS	OPT -10	Glaucoma	64	64				4	2			6
AHS	OPT -11	Low Vision Aids & Dispensing Optics	64	64				4	2			6
AHS	OPT -12	Law And Optometry	80		32			5		1		6
AHS	OPT-CT 2	Clinical Training OPT 9 to 12				256					8	8
AHS	DE 1-8	Student's choice	64					4				4
AHS	DE 1-8	Student's choice	64					4				4
			416	**128**	**64**	**256**	**864**	**26**	**4**	**2**	**8**	**40**

SCHEME OF EXAMINATION

Papers	Subject	Theory		Practical			Grand total (900)	Min pass marks (450)
		UE	IA	UE	IA	UIA*		
OPT -9	Binocular Vision & Contact Lens	80	20				100	50
OPT -10	Glaucoma & Cataract	80	20	80	20		200	100
OPT -11	Low Vision Aids & Dispensing Optics	80	20	80	20		200	100
OPT -12	Law And Optometry	80	20				100	50
OPT-CT 2	Clinical Training OPT 9 to 12					100	100	50
DEC	Discipline elective	80	20				100	50
DEC	Discipline elective	80	20				100	50

BINOCULAR VISION &CONTACT LENS

PAPER OPT – 9: BINOCULAR VISION & CONTACT LENS

NAME OF THE SUBJECT	**: BINOCULAR VISION & CONTACT LENS**
DURATION OF THEORY CLASSES	**:80 hrs**
DURATION OF TUTORIAL SESSIONS	**:32 hrs**
THEORY EXAMINATION	**: 100 marks (80 U+ 20IE)**
PRACTICAL EXAMINATION	**: NIL**
DURATION OF THEORY EXAMINATION	**: 3 hrs**
YEAR IN WHICH THE SUBJECT PAPER IS TAUGHT	**: III YEAR**

COURSE DESCRIPTION

This course provides theoretical aspects of Binocular Vision and its clinical application. It deals with basis of normal binocular vision and space perception, Gross anatomy and physiology of extra ocular muscles, various binocular vision anomalies, its diagnostic approaches and management. The subject provides the student with suitable knowledge both in theoretical and practical aspects of Contact Lenses

OBJECTIVES

At the end of the course, the student will be able to:

1. Demonstrate an in-depth knowledge of the gross anatomy and physiology relating to the extra ocular muscles.
2. Provide a detailed explanation of , and differentiate between the etiology, investigation and management of binocular vision anomalies.
3. Adapt skills and interpret clinical results following investigation of binocular vision anomalies appropriately and safely
4. Understand the basics of contact lenses
5. List the important properties of contact lenses
6. Finalise the CL design for various kinds patients

PROGRAM OUTCOMES

OPT PO 1: Performs the duty as an Optometrist with leadership qualities having a good written & communication skills and also skilled at computer applications including E- library.

OPT PO 2: To gain knowledge about laboratory safety precautions, biomedical waste management adhering to the environmental needs of the society, and preventing the spread of infectious diseases.

OPT PO 3: Understanding the structure and functions of different organs in normal human body **OPT PO 4**:To learn the general Biochemistry, Microbiology and Pathology, gaining expertise in Clinical Laboratory practices.

OPT PO 5:Be able to correct refractive errors and provide spectacle prescription

OPT PO 6: Be able to fit, evaluate, prescribe and dispense contact lenses for refractive errors and other ocular conditions

OPT PO 7: Be able to assess the low vision and provide comprehensive low vision care

OPT PO 8:Be able to have adequate knowledge to develop skill in manufacturing of spectacles, contact lenses and low vision devices.

OPT PO 9: Be able to do complete binocular vision assessment, manage non-strabismic Binocular vision anomalies and refer condition which warrants surgery

OPT PO 10: Be able to assess the visual demands for various occupations and match it to the visual capabilities. Also be able to advice on eye safety wear for various occupations.

OPT PO 11: Have knowledge and skill for early detection of various ocular conditions such as glaucoma and its pharmacological treatment.

OPT PO 12: Have knowledge regarding organizations of eye banks and preservation of ocular tissues.

OPT PO 13: Have knowledge on sensory substitution and other rehabilitation measures for totally visually challenged. To identify various life style disorders and with due counselling & guidance advising the patients with proper diet, hygiene and Yoga to keep the body, mind, soul and behavior healthy.

COURSE OUTCOMES

BSV AHS CO 1. Demonstrate an in-depth knowledge of the gross anatomy and physiology relating to the extra ocular muscles.

BSV AHS CO 2.Provide a detailed explanation of, and differentiate between the etiology, investigation and management of binocular vision anomalies.

BSV AHSCO 3 Adapt skills and interpret clinical results following investigation of binocular vision anomalies appropriately and safely.

BSV AHS CO 4.Independently investigate and diagnose case of strabismus with comments in respect to retinal correspondence and binocular single vision.

BSV AHS CO 5. Perform all the investigations to check retinal correspondence, state of Binocular Single Vision, angle of deviation and special investigations for paralytic strabismus.

BSV AHS CO 6. Understand the basics of contact lenses

BSV AHS CO 7.Know the important properties of contact lenses

BSV AHS CO 8.Prescribe the CL power for various kinds patients

BSV AHS CO 9.Recognize various types of fitting

BSV AHS CO 10.Explain all the procedures to patient and Identify and manage the adverse effects of contact lens

COURSE CONTENT

UNIT	TITLE	THEORY + TUTORIAL (80 + 32 HOURS)
I	**EVOLUTION OF BINACULAR VISION** • Theory • Physiology of vision • Simultaneous Perception • Fusion • Stereopsis **NEURAL ASPECTS OF BSV :** • Dorsal Pathway • Ventral Pathway • Visual Cortex **ARC:** • Retinal Correspondence • Normal Retinal Correspondence(NRC) • Abnormal Retinal Correspondence(ARC)	**12 + 5**
II	**STRABISMUS DIAGNOSIS** • Hirschberg's Test • Cover Test & Uncover Test • Prism Bar Test **RGP CONTACTLENS:** • Fitting Guide Lines • Diagnostic Procedure • Astigmatism, anisometropia and aniseikonia • Aphakia & Pseudophakia, Presbyopia &correction • Materials	**18 + 5**
III	**SOFT AND RGP CONTACT LENS (SPHERICAL, TORIC& MULTIFOCAL)**	**15 + 5**
	• Materials, Types of CL (Conventional, Disposable & Replacement Lenses) • Water Content Types • Base Curve, Diameter, Power • Fitting Guideline & Evaluation • Toric Rotation, LARS Formula • Ordering Contact Lenses to Lab(Parameters) • Post Fitting CL Follow Up	

IV	**CL FITTING GUIDELINES FOR KERATOCONUS** • Corneal Topography • Categorizing Keratoconus • Symptoms Clinical Science • Fitting Rose-K Contact Lenses • Slit lamp Fitting Assessment • Ordering Contact Lenses to Lab(Parameters) • Post Fitting CL FollowUp	**15 + 3**
V	**THERAPEUTIC & PROSTHETIC CONTACT LENSES** • Indication • Bandage CL • Cosmetic CL &Prosthetic CL	**10 + 2**
VI	**CONTACT LENS CARE, COMPLICATIONS &SOLUTIOS** • Lens care Procedure • Available Products • Special Clinic Procedure for Hard &RGP Lenses • Scan Biometry, Pachymetry, Scan , UBM, OCT,ERG,VEP,EOG	**10 + 2**

METHODS OF TEACHING

1. Lecture cum discussion
2. Demonstration
3. Lab visit
4. Practical work record

METHODS OF EVALUATION

1. Written Test
2. Laboratory observation Book
3. Assignments
4. Oral Presentations

BINOCULAR VISION & CONTACT LENS (PRACTICAL) 10 HOURS

- Contact lens fitting
- Refraction over contact lenses
- Contact lens fitting in special situations
- Ordering lens to the lab
- Complication of contact lenses

RECOMMENDED BOOKS

- Contact lenses fitting guide -Bhootra
- Practice of Squint and Orthoptics –A.K.Khuran
- Binocular vision and Ocular Motility - VoonNurden
- Contact lenses, fundamentals and clinical uses- HaroldA.Stein

BLUE PRINT

Unit NO	UNIT	WEIGHTAGE %	MARKS ALLOTED	LONG ANSWER (10 marks)	SHORT ANSWER (6marks)	VERY SHORT ANSWER (3 marks)
I	Evolution of strabismus	23.75 %	19	1		3
II	Strabismus diagnosis	15%	12	1*	2	1*
III	Soft and hard contact lenses	12.5%	10	1	1*	1*
IV	Contact lenses fitting for keratoconus	15%	12		1	2
V	Therepeutic contact lenses	22.5%	18		2	2
VI	Contact lenses care, complications and solutions	11.25%	9	1*		3

PAPER OPT - 9: BINOCULAR VISION & CONTACT LENS

MODEL QUESTION PAPER

TIME: 3 HRS **Max: 80 marks**

Illustrate your answer with suitable diagrams wherever necessary.

A) LONG ANSWER QUESTION **(2x10=20)**

1. a)Discuss binocular vision and its grades (OR)
   b) Explain Maddox rod procedure
2. a)Explain RGP contact lens and Fitting (OR)
   b) Classification of squint.

B) SHORT ANSWER ANY FIVE OF THE FOLLOWING **(5x6=30)**

1. Restrictive squint
2. Synoptophore
3. Diplopia charting
4. RGP fitting procedure
5. Soft contact lenses fitting procedure
6. Complications of contact lens

C) ANSWER ANY TEN OF THE FOLLOWING **(10X3=30)**

1. Yolk muscles
2. Synergists
3. ARC
4. Eccentric fixation
5. HEMA
6. Bandage CL

7. Types of prothetic contact lenses
8. Multipurpose solution
9. Handling of CL
10. Properties of contact lens solution
11. Disposable contact lenses
12. Advantages of contact lenses over spectacles

GLAUCOMA

PAPER OPT-10: GLAUCOMA

DURATION OF THEORY CLASSES	**: 64 HRS**
DURATION OF PRACTICAL SESSIONS	**: 64 HRS**
EXAMINATION THEORY MARKS	**: 100 (80U + 20IA)**
EXAMINATION PRACTICAL MARKS	**: 100**
MARKS DURATION OF THEORY EXAMINATIONS	**: 3 HRS**
SUBJECT PAPER TAUGHT IN	**: III YEAR**

COURSE DESCRIPTION

It covers clinical signs and symptoms, cause, pathophysiological mechanism, diagnostic approach, differential diagnosis and management aspects of various types of glaucoma.

OBJECTIVES

At the end of the course, the student will be able to:

- Etiology
- Epidemiology
- Symptoms
- Signs
- Course sequelae of ocular disease
- Diagnostic approach, and
- Management of the ocular diseases.

PROGRAM OUTCOMES

OPT PO 1: Performs the duty as an Optometrist with leadership qualities having a good written & communication skills and also skilled at computer applications including E- library.
OPT PO 2: To gain knowledge about laboratory safety precautions, biomedical waste management adhering to the environmental needs of the society, and preventing the spread of infectious diseases.
OPT PO 3: Understanding the structure and functions of different organs in normal human body **OPT PO 4**:To learn the general Biochemistry, Microbiology and Pathology, gaining expertise in Clinical Laboratory practices.
OPT PO 5:Be able to correct refractive errors and provide spectacle prescription
OPT PO 6: Be able to fit, evaluate, prescribe and dispense contact lenses for refractive errors and other ocular conditions
OPT PO 7: Be able to assess the low vision and provide comprehensive low vision care
OPT PO 8:Be able to have adequate knowledge to develop skill in manufacturing of spectacles, contact lenses and low vision devices.
OPT PO 9: Be able to do complete binocular vision assessment, manage non-strabismic Binocular vision anomalies and refer condition which warrants surgery
OPT PO 10: Be able to assess the visual demands for various occupations and match it to the

visual capabilities. Also be able to advice on eye safety wear for various occupations.
OPT PO 11: Have knowledge and skill for early detection of various ocular conditions such as glaucoma and its pharmacological treatment.
OPT PO 12: Have knowledge regarding organizations of eye banks and preservation of ocular tissues.
OPT PO 13: Have knowledge on sensory substitution and other rehabilitation measures for totally visually challenged. To identify various life style disorders and with due counselling & guidance advising the patients with proper diet, hygiene and Yoga to keep the body, mind, soul and behavior healthy.

COURSE OUTCOMES

At the end of the course the students should be able
GL AHS CO 1: To learn about the Applied anatomy and physiology of anterior segment
GL AHS CO 2: To know the Clinical Examination of various types of glaucoma
GL AHS CO 3: To understand the basic Definitions and classification of glaucoma
GL AHS CO 4 : To identify the Pathogenesis of glaucomatous ocular damage
GL AHS CO 5: To learn the causes, signs and symptoms of Congenital glaucoma.
GL AHS CO 6: To learn about the various field defects of Primary open angle and closed angle glaucoma.
GL AHS CO 7: To learn about the Ocular hypertension and Normal Tension Glaucoma
GL AHS CO 8: To understand the various causes and signs of Secondary Glaucoma.
GL AHS CO 9: To know the various methods of evlauation of glaucoma and changes in visual field due to disc changes
GL AHS CO 10.To learn about the Management : common medications, laser intervention and surgical techniques of Glaucoma

COURSE CONTENT

UNIT	TITLE	THEORY 64 HOURS
I	**AQUEOUS HUMOR** • Aqueous Dynamics • Recording IOP & Common Methodology • Definition & Classification	**16**
II	**GONIOSCOPY** • How to perform the angle Study • Interpretation **VISUAL FIELDS** ▪ Confrontation • Automated • Gold Man & HFA • Interpretation **Congenital Glaucoma :** Symptoms &Signs • Investigation • Management	**16**

III	**POAG** • Symptoms & Signs • Investigation • Management **PACG** • Symptoms & Signs • Investigation • Management	**16**
IV	**SECONDARY GLAUCOMA** • Symptoms & Signs • Investigation • Management	**8**
V	**COMMON MANAGEMENT** • Medical Treatment • Laser Treatment • Surgical Treatments	**8**

METHODS OF TEACHING

1. Lecture cum discussion
2. Demonstration
3. Lab visit
4. Practical work record

METHODS OF EVALUATION

1. Written Test
2. Laboratory observation Book
3. Assignments
4. Oral Presentations

GLAUCOMA – PRACTICAL (64 HOURS)

- ✓ Pupillary reflex
- ✓ corneal surface evaluation
- ✓ Visual acuity
- ✓ Performing tonometry (Schiotz & applanation)
- ✓ Tonography
- ✓ VF by confrontation method
- ✓ VFA by automated perimeter
- ✓ VF interpretation

RECOMMENDED BOOKS

- Comprehensive ophthalmology – A.K.Khurana
- Basic Ophthalmology – RenuJogi
- Practical Retinal OCT-Lumroso
- Handbook of optometry and eye disorders-Nathan
- Visual fields – David B.Hanson

BLUE PRINT

Unit NO	UNIT	WEIGHTAGE %	MARKS ALLOTED	LONG ANSWER (10 marks)	SHORT ANSWER (6marks)	VERY SHORT ANSWER (3 marks)
I	Aqueous humor	7.5%	6	1*	1*	2
II	Gonioscopy and congenital glaucoma	27.5%	22	1	1	2+1*
III	PACG,POAG	35%	28	1	2	2+1*
IV	Secondary glaucoma	15%	12	1*	1	2
V	Common management	15%	12		1	2

PAPER OPT–10: GLAUCOMA MODEL QUESTION PAPER

TIME: 3 hrs **Max: 80 marks**

Illustrate your answer with suitable diagrams wherever necessary.

A. ANSWER ANY TEN OF THE FOLLOWING: **(2x10=20)**

1. a. Write in detail about POAG(OR)
   b. Give the principle of Gonioscopy and describe in detail the structure seen on Gonioscopy with interpretation of the results
2. a. Explain the detailed classification and causes, treatment of secondary glaucoma (OR)
   b. Define intraocular pressure. Write briefly about the methods of IOP measurement and the influencing factors

B. ANSWER ANY TEN OF THE FOLLOWING: **(5x6=30)**

1. Explain about the Aqueous humour dynamics.
2. Explain about the congenital glaucoma and it‘s causes, treatment
3. Write about optic nerve head changes in POAG
4. Explain about the types of PACG
5. Write about phacolytic glaucoma
6. Write short notes on glaucoma management

C.A NSWER ANY TEN OF THE FOLLOWING: **(10X3=30)**

1. Write the types of PACG.
2. Draw the flowchart of aqueous outflow
3. Write the advantages of gonioscopy
4. Write the surgical treatment of childhood glaucoma
5. Buphthalmos
6. DVT
7. Water drinking test
8. Pupillary block mechanism
9. Seidel‘s scotoma
10. Types of lens induced glaucoma
11. NVG
12. YAG PI

LOW VISION AIDS & DISPENSING OPTICS

PAPER OPT-11– LOW VISION AIDS, DISPENSING OPTICS

DURATION OF THEORY CLASSES : 64 HRS

DURATION OF PRACTICAL SESSIONS : 64 HRS

EXAMINATION THEORY MARKS : 100 (80U + 20 IA)

EXAMINATION PRACTICAL MARKS : 100 MARKS

DURATION OF THEORY EXAMINATIONS : 3 HRS

SUBJECT PAPER TAUGHT IN : III YEAR

COURSE DESCRIPTION

Upon completion of the course, the student should be able to understand the best suitable low vision and functional assistive device for a particular condition and rehabilitation. This course gives both in- depth theoretical knowledge and clinical exposure in low vision care. This course deals with understanding the theory behind spectacle lenses and frames, their materials, types, advantages and disadvantages, calculations involved, when and how to prescribe lenses.

OBJECTIVES

At the end of the course, the student will be able to:

- To select the tool power for grinding process
- Different types of materials used to make lenses and its characteristics
- Lens designs–Bifocals, progressive lens
- Optical, Non-Optical, Electronic, and Assistive devices.
- Training for Low Vision subjects with Low vision devices

PROGRAM OUTCOMES

OPT PO 1: Performs the duty as an Optometrist with leadership qualities having a good written & communication skills and also skilled at computer applications including E- library.

OPT PO 2: To gain knowledge about laboratory safety precautions, biomedical waste management adhering to the environmental needs of the society, and preventing the spread of infectious diseases. **OPT PO 3**: Understanding the structure and functions of different organs in normal human body

OPT PO 4:To learn the general Biochemistry, Microbiology and Pathology, gaining expertise in Clinical Laboratory practices.

OPT PO 5:Be able to correct refractive errors and provide spectacle prescription

OPT PO 6: Be able to fit, evaluate, prescribe and dispense contact lenses for refractive errors and other ocular conditions

OPT PO 7: Be able to assess the low vision and provide comprehensive low vision care

OPT PO 8:Be able to have adequate knowledge to develop skill in manufacturing of spectacles, contact lenses and low vision devices.

OPT PO 9: Be able to do complete binocular vision assessment, manage non-strabismic Binocular vision anomalies and refer condition which warrants surgery

OPT PO 10: Be able to assess the visual demands for various occupations and match it to the visual capabilities. Also be able to advice on eye safety wear for various occupations.

OPT PO 11: Have knowledge and skill for early detection of various ocular conditions such as glaucoma and its pharmacological treatment.

OPT PO 12: Have knowledge regarding organizations of eye banks and preservation of ocular tissues. **OPT PO 13**: Have knowledge on sensory substitution and other rehabilitation measures for totally visually challenged. To identify various life style disorders and with due counselling & guidance advising the patients with proper diet, hygiene and Yoga to keep the body, mind, soul and behavior healthy.

COURSE OUTCOMES

At the end of this course students should able to learn

the **LV AHS CO 1**: Definition and epidemiology of Low

Vision **LV AHSCO2**: Clinical examination of Low vision

subjects

LV AHSCO3: Optical, Non-Optical, Electronic, and Assistive devices.

LV AHSCO4: Training for Low Vision subjects with Low vision devices

LV AHSCO5: Referrals and follow-up and prescribe low vision devices which consists of its design application and development of lenses, particularly of the methods of calculating their power and effect.

LV AHSCO6: Art and science of dispensing spectacle lens and frames based on the glass prescription.

LV AHSCO7: Reading of spectacle prescription. Counselling the patient

LV AHSCO8: Frame & lens measurements and selection

LV AHSCO9: Writing spectacle lens orders

LV AHSCO10: Troubleshooting complaints and handling patient‘s questions

COURSE CONTENT

UNIT	TITLE	THEORY+ PRACTICAL (64 HOURS)
I	Introduction of LV, Diagnosis, training of low vision patients and children	16
II	Optical and Non Optical Devices of LV, rehabilitation of patients	14
III	Optical manufacturing ,verification, marking and mounting of lens	10
IV	Fitting of PAL, selection of designs	12
V	Special purpose frames and optical development	12

METHODS OF TEACHING

1. Lecture cum discussion
2. Demonstration
3. Lab visit
4. Practical work record

METHODS OF EVALUATION

1. Written Test
2. Laboratory observation Book
3. Assignments
4. Oral Presentations

RECOMMENDED BOOKS

- Principles and practice of LVA –C.Dickinson
- System of ophthalmic dispensing – Clifford W Brooks & Irvin MBorish
- Low vision Aids – Monica Chaudhry
- Low vision aids practice-Bhootra

LAB PRACTICAL-64 HOURS

- Refection, special charts. Iradical retinoscopy
- Evaluating near vision: Amsier grid and filed defects, prismatic scanning
- Demonstrating aids – optical ,non-optical, Electronic
- Guidelines to determine magnification and selection low vision aids for distance, intermediate and near
- Spectacle mounted telescope and microscopes
- Choice of tests, aids in different pathological conditions
- Contact lens combined system
- Rehabilitation of the visually handicapped
- Optic center marking
- PD measurement – foe far and near

- Pupilometer
- Tints and filters to be shown–indications
- Different types of bifocal to be shown
- PAL‘s fitting

BLUE PRINT

Unit NO	UNIT	WEIGHTAGE %	MARKS ALLOTED	LONG ANSWER (10 marks)	SHORT ANSWER (6marks)	VERY SHORT ANSWER (3 marks)
I	Introduction of LV, Diagnosis, training	15%	12	1*	1	2
II	Devices of LV, rehabilitation of patients	27.5%	22	1	1+1*	2+1*
III	Optical manufacturing	11.25%	9	1*	1	1+1*
IV	Fitting of PAL, selection of designs	27.5%	22	1	1	2
V	Special purpose frames and optical development	18.75%	15		1	3

PAPER OPT 11– LOW VISION AND DISPENSING OPTICS
MODEL QUESTION PAPER

TIME: 3hrs **Max: 80 marks**

Illustrate your answer with suitable diagrams wherever necessary.

A.ANSWER ANY TEN OF THE FOLLOWING: **(2x10=20)**

1. A. Enumerate common disorders leading to low vision. Write in detail about problems and management of the following:-
   a. Corneal Opacity.
   b. Glaucoma.
   c. Age related macular degeneration. (OR)

B. Vision Rehabilitation

2. A. Write in details about spectacle lens manufacturing. (OR)

B. Fitting of progressive lenses.

B. ANSWER ANY FIVE OF THE FOLLOWING: **(5x6=30)**

1. Evaluation of low vision in Cataract, Alninism and Nystagmus
2. Define rehabilitation and enumerate steps in rehabilitation
3. Vision charts in low vision
4. Explain about the non- optical devices.
5. Optics of spectacle mounted Telescopes

6. Surface faults in lenses

C.ANSWER ANY TEN OF THE FOLLOWING: (10X3=30)

1. Define visualim pairment
2. Define low vision.
3. Blindness.
4. Log MAR Charts.
5. Pinhole spectacles
6. Typoscopes
7. Generator marks
8. Franklin bifocals
9. Pantoscopic tilt
10. Abbevalue
11. Recumbent spectacles
12. Frames for oval faces

PEDIATRIC,GERIATRIC, LAW AND OCCUPATIONAL OPTOMETRY

PAPER OPT 12 : PEDIATRIC,GERIATRIC,LAW AND OCCUPATIONAL OPTOMETRY

DURATION OF THEORY CLASSES	**: 80HRS**
DURATION OF TUTORIAL SESSIONS	**: 32HRS**
THEORY EXAMINATION TOTAL MARKS	**: 100 (80U + 20IA)**
DURATION OF THEORY EXAMINATIONS	**: 3HRS**
SUBJECT PAPER TAUGHT IN	**: III Year**

COURSE DESCRIPTION

This course is designed to provide the students adequate knowledge in theoretical and practical aspects of diagnosis, and management of eye conditions related to paediatric and geriatric population. This course deals with general aspects of occupational health, Visual demand in various job, task analyzing method ,visual standards for various jobs , occupational hazards and remedial aspects through classroom sessions and field visit to the factories.

OBJECTIVES

At the end of the course, the student will be able to:

- Be able to identify, investigate the age related changes in the eyes.
- To identify occupational causes of visual and eye problems
- To improve the quality of patient care by identifying, analyzing, and attempting to resolve the ethical problems that arise in practice
- Have a knowledge of the principal theories of childhood development, and visual development

PROGRAM OUTCOMES

OPT PO 1: Performs the duty as an Optometrist with leadership qualities having a good written & communication skills and also skilled at computer applications including E- library.

OPT PO 2: To gain knowledge about laboratory safety precautions, biomedical waste management adhering to the environmental needs of the society, and preventing the spread of infectious diseases. **OPT PO 3**: Understanding the structure and functions of different organs in normal human body

OPT PO 4:To learn the general Biochemistry, Microbiology and Pathology, gaining expertise in Clinical Laboratory practices.

OPT PO 5:Be able to correct refractive errors and provide spectacle prescription

OPT PO 6: Be able to fit, evaluate, prescribe and dispense contact lenses for refractive errors and other ocular conditions

OPT PO 7: Be able to assess the low vision and provide comprehensive low vision care

OPT PO 8:Be able to have adequate knowledge to develop skill in manufacturing of spectacles, contact lenses and low vision devices.

OPT PO 9: Be able to do complete binocular vision assessment, manage non-strabismic Binocular vision anomalies and refer condition which warrants surgery

OPT PO 10: Be able to assess the visual demands for various occupations and match it to the visual capabilities. Also be able to advice on eye safety wear for various occupations.

OPT PO 11: Have knowledge and skill for early detection of various ocular conditions such as glaucoma and its pharmacological treatment.

OPT PO 12: Have knowledge regarding organizations of eye banks and preservation of ocular tissues.

OPT PO 13: Have knowledge on sensory substitution and other rehabilitation measures for totally visually challenged. To identify various life style disorders and with due counselling & guidance advising the patients with proper diet, hygiene and Yoga to keep the body, mind, soul and behavior healthy.

COURSE OUTCOMES

At the end of the course the students should

LAW AHS CO 1: Be able to identify, investigate the age related changes in the eyes.

LAW AHS CO 2: Be able to counsel the elderly

LAW AHS CO 3: Be able to dispense spectacles with proper instructions.

LAW AHS CO 4: Adequately gained knowledge on common ocular diseases.

LAW AHS CO 5: Know the visual requirements of jobs

LAW AHS CO 6: Know the effects of physical, chemical and other hazards on eye and vision

LAW AHS CO 7: To identify occupational causes of visual problems

LAW AHS CO 8: To be able to prescribe suitable corrective lenses and eye protective wear

LAW AHS CO 9: To set visual requirements, standards for different jobs.

LAW AHS CO 10: To learn about the congenital and senile diseases and their management.

COURSE CONTENTS

UNIT	TITLE	THEORY+TUTORIAL (80 + 32HOURS)
I	**PEDIATRIC OPTOMETRY** • Examination & Diagnosis • Pathology & Structural Anomalies • Anterior Segments & Posterior Segments Assessment • EOM • Refractive Status • BSV Status • Sensory Motor Ability	**20 + 10hours**
II	**GERIATRIC OPTOMETRY** • Structural Changes • Physiological • Optic & Refractive Changes • Pseudo Aphakia, Aphakia • Ocular Diseases(CME,CSR,ARMD) • Management	**20 + 8 hours**
III	**OCCUPATIONAL OPTOMETRY** • Introduction to Occupational Health Hygiene & environment • Acts &Rules • Occupational Safety • Occular & Visual Problems	**16 + 6 hours**
IV	**PROTECTIVE EQUIPMENT** • Personal Protective Equipments • Preventional Of Occupational Diseases	**12 + 4 hours**
V	**LAW & OPTOMETRY** • International optometry • Malpractice-court • Insurance • Law Governing • Present Rules & Regulation in India	**12 + 4 hours**

METHODS OF TEACHING

1. Lecture cum discussion
2. Demonstration
3. Lab visit
4. Practical work record

METHODS OF EVALUATION

1. Written Test
2. Laboratory observation Book
3. Assignments
4. Oral Presentations

RECOMMENDED BOOKS

- Pediatric optometry – Jerome Roemer
- Vision of the aging patient – Hirsch M.J & Wick.R.E
- Clinical Examination of Ophthalmology -P.K.Mukherjee
- Manual of Ophthalmology – Nithin Nema

BLUEPRINT

Unit NO	UNIT	WEIGHTAGE %	MARKS ALLOTED	LONG ANSWER (10 Marks)	SHORT ANSWER (6 Marks)	VERY SHORT ANSWER (3 Marks)
I	Pediatric Optometry	27.5%	22	1	1	2
II	Geriatric Optometry	31.25%	25	1	1+1*	3
III	Occupational optometry	15%	12	1*	1	2
IV	Protective	11.25%	9		1	1+1*
V	Law and Optometry	15%	12	1*	1	2+1*

PAPER OPT 12: LAW AND OPTOMETRY

MODEL QUESTION PAPER

TIME: 3 HRS **Max: 80 marks**

A. LONG ANSWER QUESTIONS **(2x10=20)**

1. a) Explain clinical ethics and optometry rules in India.(OR)

   b) Discuss consumer protection act, why is it a beneficial legislation

2. a)Explain the role of optometrist in the occupational environment(OR)

   b) Explain occupational optometry

B. ANSWER ANY TEN OF THE FOLLOWING **(6x5=30)**

1. Congenital cataract
2. Acquired cataract
3. Proptosis
4. Occupational related diseases caused by physical agents, chemical agents and biological agents
5. Medical examination and pre-employment
6. Insurance

C.ANSWER ANY TEN OF THE FOLLOWING **(10X3=30)**

1. Malpractice
2. ESI act
3. Visual standards for police

4. Side shields
5. Accident analysis
6. Ocular signs of grave's disease
7. Phacolytic glaucoma
8. Arcussenilis
9. Congenital ptosis
10. Blue dot cataract
11. Sutural cataract
12. Nuclear cataract

DISCIPLINE ELECTIVE – III YEAR

B.Sc. OPTOMETRY
DISCIPLINE SPECIFIC ELECTIVE
DEC I - Biomedical waste management

NAME OF THE SUBJECT PAPER	**:**	**Biomedical Waste Management**
DURATION OF THEORY CLASSES	**:**	**64 Hrs.**
THEORY EXAMINATION	**:**	**50 Marks (40 U + 10 IA)**
PRACTICAL EXAMINATION	**:**	**NIL**
DURATION OF THEORY EXAMINATION	**:**	**1 1/2 Hrs**

Course Description

The increasing amount of Biomedical wastes (BMW) being generated is becoming a serious problem to hospitals and has significant adverse impacts on public health and occupational health if improperly handled. Biomedical waste requires utmost care in handling, collection, processing and disposal due to inherent hazards of the waste. The basic goal of the course is to provide the fundamentals of and biomedical wastes and various aspects of their management right from generation through collection and disposal. Special emphasis will be given to the system approach to managing these wastes to meet regulatory requirements.

Learning Objectives

- To sensitize the students about health care waste and its impact on health and environment.
- Acquaint the students to existing legislation, knowledge and practices regarding health care waste.

Learning Outcomes

At the end of the course the student will be able to

- Possess the knowledge on the sources of generation, of hazardous and non-hazardous waste in health care settings and research laboratories.
- Demonstrate understanding on the environmental and occupation hazards of improper BMW management.
- Understand the good practices for a systematic approach in the management of BMW
- Gain knowledge in various management strategies and technological solutions in BMW management, treatment and disposal.
- Be familiar with the applicable legislations and regulations for treatment and disposal.

SYLLABUS

1. Introduction to Hospital Waste

- Definition Classification of hospital wastes
- Types and composition: Types of solids, liquids, sharps, blood and blood tissue, radioactive material, biological and chemical material
- Hospital effluents: Nature and composition, Levels of Generation in a small clinic, nursing home, small and large hospitals, Storage of hospital waste; Types of bags and containers used for storage

2. Biomedical Waste Management Guideline

- Requirement

- Documentation of Biomedical waste types and guidelines
- Bio-medical wastes (Management & Handling) Rules, 1998; and amendments

3. Principles of Biomedical Waste Management

- Segregation of biomedical waste
- Handling and transport of hospital waste: Authorization and accidental spilling
- Methods / treatments required for disposal of pathogens
- Waste disposal methods
- Techniques of waste management
- Protocols for HW management

4. Waste prevention

- Waste reduction activities
- Waste recycling

5. Biomedical Waste Treatment Facility

- Introduction, location, land requirements
- Coverage area, types of equipment
- Infrastructure requirements
- Record keeping
- Waste collection, transport and storage facilities
- Precautions required

TEXT BOOKS

1. Sustainable Biomedical Waste Management, P. K. Behera, 2nd Edition. 2008

2. Biomedical Waste Management, R. Radhakrishnan, 1st Edition, 2005

3. The Environmental Protection Act, 1986.

MODEL QUESTION PAPER

TIME: 1 1/2 HOURS **MAXIMUM MARKS: 40**

(A) Short Answer (Answer any Five) **(5x6=30)**

1. Explain the different categories of biomedical waste.
2. Explain the different sources of health-care wastes and how the hospitals handle them.
3. What are the various guidelines given by WHO for safe health-care waste management?
4. Write the principles of hospital hazards management. Explain the various types of infections.
5. How does the color coding helps in medical waste management. Explain with examples.

(B) Very Short Answer (Any six) **(5x2=10)**

1. How will you classify healthcare waste?
2. What are waste sharps?
3. Who is at risk from health-care waste?
4. Write few rules governing the disposal of medical wastes?

5. Why is segregation important?
6. How sharps are disposed?
7. List some non-infectious wastes in hospital.
8. What is chemical disinfection?

DISCIPLINE ELECTIVE – DEC – II : EYE BANKING

NAME OF THE SUBJECT PAPER : **EYE BANKING**

DURATION OF THEORY CLASSES : **64 HOURS**

DURATION OF PRACTICAL SESSIONS : **NIL**

EXAMINATION : **50 MARKS (40 U+10 IA)**

DURATION OF THEORY EXAMINATION : **1 1/2 Hrs**

COURSE DESCRIPTION

To understand the basic concepts of corneal transplantation, and the process of preservation of corneal donor in the eye bank.

COURSE OBJECTIVES

- To learn about the process of Eye banking and its requirements
- To learn about the methods of preservation of corneal donors in the eye bank.

SYLLABUS

S.NO	UNIT	KEY LEARNING OUTCOMES	TOTAL HOURS
1	Eye Banking	● Publicity, prerquisitives of eye donation, how to donate your eyes ● Collection of donor eyes ● Preservation of eyes ● General concepts about corneal transplantation	30
2	Facilities, Equipment & Maintenance of Eye Banking	● Facilities and infrastructure requirement for eye banking ● Eye bank maintenance ● Equipment maintenance and cleaning ● Instruments and reagents ● Infection control and safet	34

MODEL QUESTION PAPER

TIME: 1 1/2 HOURS **MAXIMUM MARKS: 40**

(A) Short Answer (Answer any FIVE) **(5x6=30)**

1. Describe the methods of preservation of corneal donors
2. Write in detail about General concepts about corneal transplantation
1. Write Importance of Eye bank maintenance
2. Discuss about Facilities and infrastructure requirement for eye banking
3. Instruments and reagents used in eye banking
4. Write about the Publicity and pre requirements for eye donation
5. Write about the functions of the eye bank

(B) Very Short Answer (Any five) **(5x2=10)**

1. What is Eye Bank?
2. define ETBC
3. Equipments needed for eye bank
4. steps of eye donation
5. what is Enucleation.

DEC III –COMMUNITY OPTOMETRY

NAME OF THE SUBJECT PAPER	**: COMMUNITY OPTOMETRY**
DURATION OF THEORY CLASSES	**: 64 HOURS**
DURATION OF PRACTICAL SESSIONS	**: NIL**
EXAMINATION	**: 50 MARKS (40 U+10 IA)**
DURATION OF THEORY EXAMINATION	**: 1 1/2 Hrs**

COURSE DESCRIPTION

This course is a discussion of the principles and programs developed to know about the ocular diseases within a community. Primary topics covered include: government and nongovernment related programs and an introduction to developing community-based intervention programs (needs assessment, intervention, and evaluation).

OBJECTIVES

- Explain the characteristics, functions and processes of a community and identify the role of Optometrist.
- To evaluate the different methods for assessing ocular status and health in the community.
- To learn about the public health medicine, organization of health services and improving in vision care services.

COURSE CONTENT

UNIT	TOPIC	KEY LEARNING OUTCOMES	TOTAL HOURS
1	Philosophy of Public Health	• History of public health medicine • History of public health optometry	14
2	Health care systems	• Organization of health services (principles of primary, secondary and tertiary care) • Determinants of health care delivery system • Quality assurance in patient care services	15
3	Modes of health and vision care delivery	• Solo and group practice modes • Multidisciplinary, interdisciplinary and institutional practice modes • Optometry's role as a primary care profession	10
4	Basic concepts of Community Optometry	● Introduction, history ● Global medicine and evolution of public health in India ● Health care delivery systems in India in terms of Optometry ● Determinants of ophthalmic health ● Levels of prevention ● Role of optometrist in Community	15
5	Eye Care Programme	● School Eye screening programme ● Primary eye care; organization of out-reach services and reach-in programmes ● Rehabilitation of the visually impaired ● National programe for the control of Blindness (NPCB) ● Nutritional blindness with reference to vitamin A deficiency	10

Reference Books:

1. Oxford Text Book of Public Health & Preventive Medicine, (Vol I to I)

MODEL QUESTION PAPER

TIME: `1 1/2 HOURS **MAXIMUM MARKS: 40**

(A) Short Answer (Answer any FIVE) **(5x6=30)**

1. Write in detail about role of optometry in community health care
2. Describe the primary, secondary and tertiary health care services in Community Optometry
3. Write the concept of community Optometry?
4. Write about NPCB
5. Bring out the importance of School screening
6. Multidisciplinary team approach

(B) Very Short Answer (Answer any FIVE) **(5x2=10)**

1. Define community Optometry
2. Define night blindness
3. How will you assess the visual status of preschool children?
4. What are the advantages of VISION 2020?
5. What are the levels of ophthalmic health?

DISCIPLINE SPECIFIC ELECTIVE
DEC IV - OCULAR PHARMACOLOGY

NAME OF THE SUBJECT PAPER	**: OCULAR PHARMACOLOGY**
DURATION OF THEORY CLASSES	**: 64 HOURS**
DURATION OF PRACTICAL SESSIONS	**: NIL**
EXAMINATION	**: 50 MARKS (40 U+10 IA)**
DURATION OF THEORY EXAMINATION	**: 1 1/2 Hrs**

COURSE DESCRIPTION

This course covers the actions, uses, adverse effects and mode of administration of ocular drug.

OBJECTIVES

At the end of the course the students will acquire knowledge in the following Aspects

1. Basic principle of pharmacokinetics & Pharmacodynamics
2. Commonly used ocular drugs, mechanism, indications, contraindications, drug dosage and adverse effects.

COURSE CONTENT

UNIT	TOPIC	KEY LEARNING OUTCOMES	TOTAL HOURS
1	General Pharmacology	• Introduction & sources of drugs, Routes of drug administration, • Pharmacokinetics (emphasis on ocular pharmacokinetics), Pharmacodynamics & factors • modifying drug actions.	22
2	Ocular Pharmacology	• Ocular Pharmacology- An introduction • Autonomic nervous system • Routes of drug administration • Miotics, Mydriatics & Cycloplegics drugs • Antibacterial drugs & therapy • Antifungal drugs & therapy • Anti- Viral drugs & therapy • Anti-inflammatory drugs & therapy • Anti- glaucoma drugs & therapy	20
3	Diagnostic & Therapeutic applications of drugs used in Ophthalmology:	• Diagnostic • Drugs & biological agents used in ocular surgery, Anaesthetics used in ophthalmic procedures, Anti-glaucoma drugs • Pharmacotherapy of ocular infections –Bacterial, viral, fungal & chlamydial • Drugs used in allergic, inflammatory& degenerative conditions of the eye; • Immune modulators in Ophthalmic practice, Wetting agents & tear substitutes	22

TEXT BOOK/REFERENCE BOOKS:

1. Clinical ocular pharmacology 5th edition, Jimmy D.Bartlett, Siret D.Jaanus

MODEL QUESTION PAPER

TIME: 1 1/2 HOURS **MAXIMUM MARKS: 40**

(A) Short Answer (Answer any FIVE) **(5x6=30)**

1. Describe the routes of drug administration
2. Write in detail about Antifungal and Antibacterial drug therapy
3. Write Importance of Ophthalmic preservatives
4. Discuss about Immuno suppressive agents
5. Write in Drugs used in allergic, inflammatory& degenerative conditions of the eye
6. Write the Drugs & biological agents used in ocular surgery

(B) Very Short Answer (Any five) **(5x2=10)**

1. Anti-Glaucoma drugs
2. Write Classification of Ophthalmic drugs
3. Ocular Antiseptics
4. Name three ocular Lubricants
5. Anti cataract agents

DISCIPLINE ELECTIVE
DEC – V : VISUAL DIAGNOSTICS FOR CHILDREN WITH SPECIAL NEEDS

NAME OF THE SUBJECT PAPER	**: VISUAL DIAGNOSTICS FOR CHILDREN WITH SPECIAL NEEDS**
DURATION OF THEORY CLASSES	**: 64 HOURS**
DURATION OF PRACTICAL SESSIONS	**: NIL**
EXAMINATION	**: 50 MARKS (40 U+10 IA)**
DURATION OF THEORY EXAMINATION	**: 1 1/2 Hrs**

COURSE DESCRITPION

To help and expand the student's knowledge base in all aspects of special population and the ways to meet their visual needs.

COURSE OBJECTIVES

- Able to identify the special population.
- Able to diagnose the visual insufficiencies.
- Able to initiate a management plan.

COURSE CONTENT

UNIT	TOPICS	KEY LEARNING OUTCOMES	TOTAL HOURS(64)
1	Overview of visual development	Visual spatial skills Visual analysis skills • Form perception • Visual attention • Visual memory • Visualization Visual motor integration	10
2	Overview of special population	Cerebral palsy Down syndrome Autism Attention deficit hyperactivity disorder (ADHD)	15
3	Comprehensive examination	Quality of life assessment questionnaires Visual acuity assessment method Color vision Visual field testing Eye movement	14
4	Diagnosis and management in special population	Refractive error Oculomotor dysfunction Vision information processing.	25

References

1. Visual Diagnosis and care of the patient with special needs, Marc B, Mary Bartuccio, Dominick.

MODEL QUESTION PAPER

TIME: 1 1/2 HOURS **MAXIMUM MARKS: 40**

(A) Short Answer (Answer any FIVE) **(5x6=30)**

1. Write about Vision information processing.
2. Explain in detail about ADHD
3. Write about a visual development
4. Write about comprehensive examination.
5. Explain about down syndrome

(B) Very Short Answer (Any FIVE) **(5x2=10)**

1. Define visual memory
2. What is visual information processing?
3. Write about visual acuity assessment method
4. Define autism
5. Write about visual field testing
6. What is the management of special population?
7. How to manage the refractive error in special population
8. Define cerebral palsy

QUESTION BANK

B.Sc. AHS I YEAR

PAPER-1: ANATOMY

UNIT: 1 GENERAL ANATOMY

HUMAN CELL

Q. NO	TOPICS	TYPE
1.	Discuss the Cell & its Organelles.	SAQ

EPITHELIUM

Q.NO	TOPICS	TYPE
1.	Classification of Epithelium with its examples.	SAQ
2.	Draw the neat label diagram of Simple epithelium with its examples.	SAQ
3.	Draw the neat label diagram of Compound epithelium with its examples.	SAQ
4.	Write a note on Goblet cell.	VSAQ
5.	Write a note on Basement membrane of epithelium.	VSAQ

GLANDS

Q.NO	TOPICS	TYPE
1.	Classification of Glands with its examples.	SAQ
2.	Discuss the Microscopic structure of Mucous / Serous / Mixed salivary gland with its examples.	SAQ

CARTILAGE

Q.NO	TOPICS	TYPE
1.	Discuss the Microscopic structure of Hyaline cartilage / Elastic cartilage / White fibro cartilage with its examples.	SAQ
2.	Classification of Cartilage with its examples.	VSAQ
3.	Write a note on Perichondrium.	VSAQ

BONE

Q.NO	TOPICS	TYPE
1.	Classification of Bones with its examples.	SAQ
2.	Draw & Discuss the Microscopic structure of Compact bone (T.S)	SAQ
3.	Discuss the blood supply of long bone.	SAQ
4.	List out the bones in region wise.	SAQ
5.	State the parts of growing long bone.	VSAQ
6.	State the parts of adult long bone.	VSAQ
7.	Write a note on Periosteum.	VSAQ
8.	Write a note on carpal bones.	VSAQ
9.	Write a note on Sesamoid bone.	VSAQ
10.	Write a note on Fontanellae of fetal skull.	VSAQ
11.	Write a note on Haversion system of compact bone.	VSAQ
12.	List out the structural differences between the Bone & Cartilage.	VSAQ

JOINTS

Q.NO	TOPICS	TYPE
1.	Classification of Joints with its examples.	SAQ
2.	Classification of Synovial joint with its examples.	SAQ
3.	Discuss the structure of synovial joint.	SAQ

4.	Classification of Cartilagenous joint with its examples.	SAQ

MUSCULAR TISSUE

Q.NO	TOPICS	TYPE
1.	Draw & Discuss the Microscopic structure of Skeletal muscle / Cardiac muscle / Smooth muscle with its examples.	SAQ
2.	Classification of muscular tissue with its examples.	VSAQ
3.	State the muscles of mastication & its nerve supply.	VSAQ
4.	List out the microscopic structural differences between the types of muscles.	VSAQ

SKIN

Q.NO	TOPICS	TYPE
1.	Draw & Discuss the Microscopic structure of Thick / Thin skin.	SAQ
2.	Classification / Types of skin with its example.	VSAQ
3.	List out the structural differences between the types of skin.	VSAQ

UNIT: 2 CARDIOVASCULAR SYSTEMS

MEDIASTINUM

Q.NO	TOPICS	TYPE
1.	Definition, location & general boundary / outline boundary of Mediastinum.	SAQ
2.	Discuss the boundaries & contents of Superior mediastinum.	SAQ
3.	Discuss the boundaries & contents of Inferior mediastinum.	SAQ

HEART

Q.NO	TOPICS	TYPE
1.	Explain the gross features of Right atrium under following headings – a) Definition, b) location, c) external features, d) internal features, e) Function, f) arterial supply.	LAQ
2.	Describe the Blood supply of Heart.	LAQ
3.	Discuss the location & External features of Heart.	SAQ
4.	Discuss the Valves of Heart. (A.V -valve & Semilunar valve)	SAQ
5.	Discuss the Systemic & Pulmonary circulation of Heart.	SAQ
6.	Discuss the Right coronary artery / Left coronary artery under following headings – a) Origin, b) course, c) branches.	SAQ
7.	Write a note on Apex of Heart.	VSAQ
8.	List out the chambers & great blood vessels of Heart.	VSAQ
9.	Trace the conducting system of Heart.	VSAQ
10.	State the definition, layers, sinuses & nerve supply of Pericardium.	VSAQ

BLOOD VESSELS

Q.NO	TOPICS	TYPE
1.	Describe the Portal vein under following headings – a) Definition, b) formation, c) location, d) course, e) branches, f) Parts, g) Tributaries.	LAQ
2.	Explain the Cavernous sinus under following headings – a) Definition, b) location, c) measurement, d) extension, e) relations,	LAQ

	f) Tributaries, g) communications.	
3.	Parts & branches of Aorta	SAQ
4.	Discuss the origin, course, parts & branches of Subclavian artery.	SAQ
5.	Discuss the origin, course, parts & branches of Axillary artery.	SAQ
6.	Discuss the origin, course & branches of Brachial artery.	SAQ
7.	Discuss the origin & branches of Internal iliac artery.	SAQ
8.	Discuss the origin, course & branches of External carotid artery.	SAQ
9.	Discuss the origin, parts, course & branches of Internal carotid artery.	SAQ
10.	Classification of Dural venous sinuses.	SAQ / VSAQ
11.	Enumerate the branches of Brachial artery.	VSAQ
12.	State the branches of Radial & Ulnar artery.	VSAQ
13.	State the branches of Femoral artery.	VSAQ
14.	List out the sites of Peripheral pulse.	VSAQ
15.	List out the sites of Porto caval anastomosis.	VSAQ
16.	State the formation, course & termination of Great saphenous vein / Short saphenous vein.	VSAQ
17.	Write a note on Cysterna chyli.	VSAQ
18.	Formation, location & branches of Superficial palmar arch / Deep palmar arch.	VSAQ

UNIT: 3 RESPIRATORY SYSTEM

Q.NO	TOPICS	TYPE
1.	Explain the **Larynx** under following headings – a) Definition, b) location, c) extension, d) measurement, e) Skeletal framework, f) function.	LAQ
2.	Explain the **Lung** under following headings – a) Definition, b) location, c) coverings, d) weight & Colour, e) external features, f) medial surface impression, g) hilum, h) Root of lung, i) blood supply, j) note on Bronchopulmonary segments.	LAQ
3.	Discuss the definition, formation & structures opening in the Lateral wall of nose.	SAQ
4.	Discuss the definition, extension, measurement, external feature of Trachea.	SAQ
5.	Discuss the definition, layers, parts of layers, recesses, nerve supply of Pleura.	SAQ / VSAQ
6.	State the parts of Respiratory system.	VSAQ
7.	Enumerate the structures forming the Nasal septum.	VSAQ
8.	Write a note on Carina.	VSAQ
9.	Write a note on Bronchopulmonary segments.	VSAQ
10.	List out the Para nasal air sinuses.	VSAQ
11.	Enumerate the muscles of Respiration & state its nerve supply.	VSAQ

UNIT: 4 DIGESTIVE SYSTEMS

Q.NO	TOPICS	TYPE
1.	Describe the **Tongue** under following headings – a) Definition, b) location, c) parts, d) external features, e) muscles, f) Nerve supply.	LAQ
2.	Explain the **Pharynx** under following headings –	LAQ

	a) Definition, b) location, c) extension, d) sub-division, e) Muscles forming the pharynx, f) nerve supply.	
3.	Explain the **Stomach** under following headings – a) Definition, b) location, c) capacity, d) measurement, e) External features, f) Parts, g) relations, h) blood supply.	LAQ
4.	Describe the **Duodenum** under following headings – a) Definition, b) location, c) parts, d) measurement, e) external features, f) Internal features (2^{nd} part), g) blood supply.	LAQ
5.	Explain the **Liver** under following headings – a) Definition, b) location, c) Colour, d) weight, e) external features, f) Relations, g) bare area, h) Porta hepatis, i) blood supply, j) function.	LAQ
6.	Explain the **Pancreas** under following headings – a) Definition, b) location, c) anatomical & functional parts, d) measurement, e) Colour, f) external features, g) relations, h) Duct of pancreas, i) Blood supply.	LAQ
7.	Discuss the location & external features of Tongue.	SAQ
8.	Discuss the parts, muscles of Tongue & state its nerve supply.	SAQ
9.	Discuss the location, external features, parts & blood supply of stomach.	SAQ
10.	Discuss the external & internal features of the 2^{nd} part of Duodenum.	SAQ
11.	Discuss the Caecum under following headings – a) Definition, b) location, c) measurement, d) types, e) external features, f) Internal features, g) blood supply.	SAQ
12.	Discuss the Appendix under following headings – a) Definition, b) location, c) parts, d) measurement, e) position, f) Blood supply.	SAQ
13.	Discuss the characteristic features / cardinal features of Large intestine.	SAQ
14.	Discuss the Extra hepatic biliary apparatus under following headings – a) Definition, b) parts, c) measurement, d) function, e) Note on gall bladder.	SAQ
15.	Discuss the definition, location, origin, course & branches of Coeliac trunk.	SAQ
16.	List out the parts of Digestive system.	VSAQ
17.	State the parts & papillae of Tongue.	VSAQ
18.	State the nerve supply of Tongue.	VSAQ
19.	Enumerate the muscles of Tongue.	VSAQ
20.	State the extension & sub-divisions of Pharynx.	VSAQ
21.	State the extension & constrictions of Esophagus.	VSAQ
22.	List out the structural differences between the Jejunum & Ileum.	VSAQ
23.	State the location & types of Caecum.	VSAQ
24.	State the location / parts & position of Appendix.	VSAQ
25.	Write a note on Porta hepatis.	VSAQ
26.	Write a note on bare area of Liver.	VSAQ
27.	Write a note on Pancreatic duct.	VSAQ
28.	Enumerate the parts & function of Biliary apparatus.	VSAQ
29.	Classification of Salivary glands.	VSAQ
30.	State the branches of Superior mesenteric artery.	VSAQ
31.	State the branches of Inferior mesenteric artery.	VSAQ

32.	State formation of Marginal artery / artery of Drummond.	VSAQ

UNIT: 5 URINARY SYSTEM

Q.NO	TOPICS	TYPE
1.	Explain the Kidney under following headings – a) Definition, b) location, c) measurement, d) Colour, e) external features, f) Hilum, g) relations, h) coverings, i) internal features, j) Blood supply.	LAQ
2.	Explain the Urinary bladder under following headings – a) Definition, b) location, c) shape, d) measurement, e) capacity, f) External features, g) relations, h) supports, i) Internal features (Trigone of urinary bladder), j) blood supply, k) role.	LAQ
3.	Discuss the location & relations of Kidney.	SAQ
4.	Discuss the extension, parts, measurement, constrictions & blood supply of Ureter.	SAQ
5.	Discuss the external features & supports of Urinary bladder.	SAQ
6.	State the parts of Urinary system.	VSAQ
7.	Write a note on hilum of kidney.	VSAQ
8.	State the extension, parts & constrictions of ureter.	VSAQ
9.	Write a note on Trigone of urinary bladder.	VSAQ
10.	State the definition, extension & parts of Male urethra.	VSAQ
11.	Write a note on Female urethra.	VSAQ

UNIT: 6 REPRODUCTIVE SYSTEMS
MALE REPRODUCTIVE SYSTEM

Q.NO	TOPICS	TYPE
1.	Explain the **Testis** under following headings – a) Definition, b) location, c) measurement, d) shape, e) external features, f) Coverings, g) internal features, h) functions, i) blood supply.	LAQ
2.	Describe the **Prostate gland** under following headings – a) Definition, b) location, c) shape, d) measurement, e) shape, f) External features, g) lobes, h) coverings, i) blood supply.	LAQ
3.	Discuss the location, external features, layers & blood supply of Scrotum.	SAQ
4.	Discuss the External & internal features of Testis.	SAQ
5.	Discuss the External features, lobes & coverings of Prostate.	SAQ
6.	State the parts of Male Reproductive system.	VSAQ.
7.	Enumerate the layers of Scrotum & state its nerve supply.	VSAQ.
8.	State the parts & role of Epididymis.	VSAQ.
9.	State the coverings of Testis & Prostate.	VSAQ.
10.	State the coverings & contents of Spermaticcord.	VSAQ.

FEMALE REPRODUCTIVE SYSTEM

Q.NO	TOPICS	TYPE
1.	Explain the **Mammary gland** under following headings – a) Definition, b) location, c) extension, d) shape, e) structures / features, f) Blood supply.	LAQ
2.	Explain the **Uterus** under following headings – a) Definition, b) location, c) shape, d) measurement,	LAQ

	e) external features, f) Positions, g) relations, h) supports, i) blood supply.	
3.	Discuss the Gross structure of Mammary gland.	SAQ
4.	Discuss the location & external features of Uterus.	SAQ
5.	Discuss the location, position & supports of Uterus.	SAQ
6.	Discuss the external & internal features of Ovary.	SAQ
7.	State the parts of Female Reproductive system.	VSAQ
8.	State the parts & role of Fallopian tube.	VSAQ
9.	Enumerate the ovarian follicles.	VSAQ
10.	State the parts & positions of Uterus.	VSAQ

UNIT: 7 ENDO CRINE SYSTEM

Q.NO	TOPICS	TYPE
1.	Describe the **Thyroid gland** under following headings – a) Definition, b) location, c) hormones, d) peculiarities, e) external features, f) Parts, g) relations, h) coverings, i) blood supply, j) Functions.	LAQ
2.	Explain the **Pituitary gland** under following headings – a) Definition, b) location, c) shape, d) measurement, e) external features & hormones, f) Blood supply.	LAQ
3.	Explain the **Suprarenal gland** under following headings – a) Definition, b) location, c) measurement, d) external features, e) Internal features, f) hormones, g) blood supply.	LAQ
4.	Discuss the external features of Thyroid gland, state its coverings & blood supply.	SAQ
5.	Discuss the external features & hormones of Pituitary gland.	SAQ
6.	Discuss the external & internal features of Suprarenal gland & state its hormones.	SAQ
7.	List out the Endocrine glands.	VSAQ
8	Classification of Endocrine glands.	VSAQ
9.	State the location & blood supply of Thyroid gland.	VSAQ
10.	State the location & hormones of Pituitary gland.	VSAQ
11.	State the location & hormones of Parathyroid gland.	VSAQ

UNIT: 8 NERVOUS SYSTEM

Q.NO	TOPICS	TYPE
1.	Classification of Nervous system.	SAQ
2.	Discuss the Cerebrum under following headings – a) Definition, b) location, c) external features.	SAQ
3.	Discuss the external features & blood supply of Cerebrum.	SAQ
4.	Discuss the Supero-lateral surface of Cerebrum.	SAQ
5.	Discuss the Cerebellum under following headings – a) Definition, b) location, c) nucleus, d) functions, e) blood supply.	SAQ
6.	Discuss the Spinal cord under following headings – a) Definition, b) location, c) extension, d) measurement, e) coverings, f) Blood supply.	SAQ
7.	Discuss the extension & external features of Spinal cord.	SAQ
8.	Discuss the location & external features of Midbrain.	SAQ
9.	Discuss the location & external features of Pons.	SAQ
10.	Discuss the location & external features of Medulla oblongata.	SAQ
11.	Discuss the blood supply of Brain.	SAQ

12.	Discuss the formation of Circle of Willis.	SAQ
13.	Classification of Cranial nerves.	SAQ / VSAQ
14.	State the parts of Brain.	VSAQ
15.	Write a note on Sulci & Gyri.	VSAQ
16.	State the location & nucleus of Cerebellum.	VSAQ
17.	State the layers of Meninges & its space.	VSAQ
19.	State the layers of meninges & its modification.	VSAQ
18.	State the modification of Spinal meninges.	VSAQ
20.	Enumerate the cranial nerves emerges from Midbrain / Pons / Medulla oblongata.	VSAQ
21.	List out the Cranial nerves.	VSAQ
22.	List out the Basal nuclei	VSAQ
23.	State the location & parts of Corpus callosum.	VSAQ

UNIT: 9 GENERAL EMBRYOLOGY

Q.NO	TOPICS	TYPE
1.	Discuss the stages of Spermatogenesis.	SAQ
2.	Discuss the stages of Oogenesis.	SAQ
3.	Discuss the Placenta under following headings – a) Definition, b) external features, c) functions.	SAQ
4.	Write a note on Fertilization & state its phases.	VSAQ
5.	Write a note on Implantation.	VSAQ
6.	Write a note on Ovulation.	VSAQ

PAPER 2 - PHYSIOLOGY

UNIT – I

GENERAL PHYSIOLOGY

Very short answer questions (VSAQ)

1. Draw labeled diagram of human cell and mention any four functions of cell organelles.
2. Explain one function of
   a) Mitochondria, b). Golgi apparatus
   c) Endoplasmic reticulum d) Ribosome
3. Give two differences between mitosis and meiosis.
4. Name the phases of mitosis
5. Name different types of intercellular connections?
6. Classify various mechanisms of transport across cell membrane.
7. Describe different mechanism of passive transport across the cell membrane
8. Describe different mechanism of active transport across the cell membrane
9. Define osmosis. Give examples.
10. Define symport. Give one example.
11. Define antiport. Give one example.
12. Define homeostasis. Name the types of feedback mechanisms involved in homeostasis with one example.
13. Briefly explain negative feedback mechanisms with examples.
14. Briefly explain positive feedback mechanisms with examples.
15. Give normal values of i) Intracellular fluid (ICF), ii) Extracellular fluid (ECF), iii) plasma and iv) Interstitial fluid

HEMATOLOGY (BLOOD)

Long answer questions (LAQ)

1. What is erythropoiesis? Describe the stages and factors influencing it.
2. What is anemia? Describe the types of anemia. Give the blood picture in each of them.
3. What s immunity? Explain its types.
4. Explain the mechanism of hemostasis.
5. Explain intrinsic and extrinsic mechanisms of blood clotting.
6. Name the blood group systems. Explain the basis for its classification. Add a note on its clinical importance.

Short answer questions (SAQ)

1. Briefly describe the composition of blood.
2. Write the functions of blood.
3. List the plasma proteins. Write its functions.
4. What is Erythropoiesis? List its stages.
5. Define anemia with types. Explain iron deficiency anemia.
6. Briefly explain ABO and Rh system.
7. Erythroblastosis fetalis.
8. Define hemostasis with stages.
9. Name the clotting factors.
10. Define immunity. What are its types?

Very short answer questions (VSAQ)

1. Classifications of WBC.
2. Functions of neutrophil.
3. What is Phagocytosis?
4. Functions of eosinophil.
5. Functions of basophil.
6. Functions of lymphocytes.
7. Functions of red blood cell (RBC).
8. Write the normal values of hemoglobin in adults male and female.
9. Functions of hemoglobin.
10. Functions of platelets.
11. What is hemophilia?
12. What is anticoagulant?
13. Name any two anticoagulants.
14. Name the blood group systems.
15. Define Landsteiner's law.
16. Mismatch transfusion.

UNIT – II

CARDIOVASCULAR SYSTEM

Long answer questions (LAQ)

1. Define cardiac cycle. Explain with the help of a diagram the mechanical and pressure changes during cardiac cycle.
2. Draw a labelled diagram showing the innervations of heart. Describe the regulation of heart rate.
3. Define blood pressure. Give its normal values. Write the factors controlling blood pressure.
4. Define cardiac output and cardiac index. Give its normal values. Describe the factors regulating cardiac output.
5. What is shock? What are its types? Discuss the cardiovascular compensatory changes that occur during shock.

Short Answer Questions (SAQ)

1. Write the difference between pulmonary and systemic circulation.
2. Briefly describe the conducting system of heart.
3. Draw labeled diagram of conducting system of heart.
4. List out the properties of cardiac muscle. Briefly explain any two properties.
5. Draw a normal Lead II ECG indicating its waves and segments.
6. Define blood pressure (BP). What are the components of it and write its normal range.
7. List the factors affecting blood pressure
8. Define cardiac cycle. List the events during cardiac cycle.
9. Define shock. Name its types.
10. Briefly explain the types of heart sounds.

Very Short Answer Questions (VSAQ)

1. Write any two differentiating points between pulmonary and systemic circulation.
2. Define blood pressure.
3. What is systolic blood pressure? Write its normal value.
4. What is diastolic blood pressure? Write ifs normal value.
5. Define pulse. Write its normal range.
6. Write any two difference between tachycardia and bradycardia
7. Define cardiac output. Write its normal values.
8. Define stroke volume. Write its normal values.
9. What is electrocardiogram (ECG)?
10. List any four properties of cardiac muscle

UNIT III
RESPIRATORY SYSTEM

Long answer questions (LAQ)

1. Describe the mechanics of breathing.
2. Explain oxygen transport in the blood. Describe the oxygen dissociation curve.
3. Discuss the transport of carbon dioxide in the blood.
4. Name the respiratory centers. Explain the neural regulation of respiration.
5. Classify hypoxia. Describe the types with suitable examples.

Short answer questions (SAQ)

1. Briefly explain the mechanism of inspiration.
2. Briefly explain the mechanism of expiration.
3. Draw labeled diagram of pontine and medullary respiratory centers.
4. Briefly explain the transport of oxygen in the blood
5. Briefly explain the transport of carbon dioxide in the blood.
6. Draw labeled diagram of normal spirogram indicating lung volume and capacities.
7. Define and give normal values of lung volumes.
8. Define and give normal values of lung capacities.
9. What is surfactant? Give its function.
10. Define hypoxia. List its various types.
11. Classify and explain any one type of hypoxia.

Very short answer questions (VSAQ)

1. Name the inspiratory muscles.
2. Name the expiratory muscles.
3. Name the respiratory and non-respiratory functions of lungs.
4. Write any four functions of respiratory system.
5. Function of surfactant.
6. Name the respiratory centers.
7. Normal values of lung volumes.
8. Normal values of lung capacities.
9. Draw labeled diagram of respiratory center.
10. List the types of hypoxia
11. Vital Capacity.

12. What is dead space?
13. What is hypoxia?
14. What is dyspnea?
15. What is cyanosis?
16. What is periodic breathing?

UNIT – IV
IV – GASTRO-INTESTINAL PHYSIOLOGY

Long Answer Questions (LAQ)

1. Describe the phase and control of deglutition. Add a note on its applied importance.
2. Write the composition of saliva? Describe the regulation of salivary secretion. Discuss its functions.
3. Describe the composition and phases of gastric secretion. Briefly explain the HCl secretion in stomach.
4. Describe the phases of pancreatic secretion.

Short Answer Questions (SAQ)

1. Give the composition and functions of saliva?
2. Give composition and functions of gastric secretion?
3. Briefly explain mechanism of HCl secretion
4. Give composition and functions of pancreatic secretion?
5. Briefly explain entero-hepatic circulation with neat diagram.
6. Briefly explain the functions of liver.
7. Classify gastro intestinal (GI) hormones and write its actions of any two hormones.
8. Peptic ulcer.

Very Short Answer Questions (VSAQ)

1. What is mastication?
2. What is deglutition?
3. Write any four functions of saliva.
4. Write any four functions of liver.
5. Functions of pancreatic juice.
6. Name any four GI hormones.
7. Functions of gastrin.
8. Functions of secretin.
9. Functions of cholecystokinin pancreozymin.
10. What are the movements of stomach?
11. What are the movements of small intestine?
12. What are the movements of large intestine?
13. Write any four functions of bile.
14. What is the difference between liver and gall bladder bile?

UNIT – IV
RENAL PHYSIOLOGY (EXCRETORY SYSTEM)

Long Answer Questions (LAQ)

1. Describe the mechanism of urine formation.
2. Define GFR (Glomerular filtration rate). Write its normal values. Briefly explain the factors affecting GFR.

3. Describe the Structure and functions of juxta glomerular apparatus
4. Draw a labeled diagram showing nerve supply to the urinary bladder. Explain the mechanism of micturition. What is a neurogenic bladder?
5. Describe the role of counter current multiplier and exchange system in concentrating urine.
6. Discuss the role of different buffer systems in regulation of acid – base balance.

Short Answer Questions (SAQ)

1. Briefly explain the functions of kidney.
2. Briefly explain the formation of urine.
3. Briefly explain mechanism behind voiding of urine.
4. Define GFR (Glomerular filtration rate). Write its normal values. List the factors affecting GFR.
5. What is the normal renal blood flow? How is it measured?
6. List the Special features of renal blood flow.
7. List any three differences between Cortical and Juxtamedullary nephrons.
8. Draw a labeled diagram of juxtaglomerular apparatus. What are its functions?
9. With a flow chart and suitable diagram, indicate the process of micturition reflex.
10. Briefly explain the role of ADH (Anti-diuretic hormone) on kidney?
11. Briefly explain renal dialysis.

Very Short Answer Questions (VSAQ)

1. Draw labeled diagram of a nephron.
2. Draw labeled diagram of filtration membrane
3. Write any four functions of kidney.
4. Functions of macula densa and Juxtaglomerular cells
5. What are the steps of urine formation?
6. Give one substances used to measure GFR and renal plasma flow.
7. What is micturition reflex?
8. What is cystometrogram?
9. Filtration fraction.
10. Define renal clearance.
11. Name the types of renal clearance.
12. List any three differences between cortical and medullary nephrons.
13. What is diuresis?
14. What is diuretics?
15. Name any two diuretics.
16. Give two functions of skin?

UNIT – V

V - ENDOCRINE PHYSIOLOGY

Short Answer Questions (SAQ)

1. List the anterior pituitary (Adenohypophysis) hormones. Give any two hormone functions.
2. Mention the physiological role of GH (Growth hormone). Add a note on its hyper and hypo secretion.
3. Name the posterior pituitary hormones. Give their functions.
4. Name the adrenal cortical and medullary hormones. Mention the functions of glucocorticoids.

5. Mention the functions of aldosterone.
6. Name the thyroid hormones. Write its functions.
7. Name the hormones synthesized by pancrease. Mention their role in maintaining blood glucose.
8. Explain the actions of hormones on hyperglycemia and hypoglycemia.

Very Short Answer Questions (VSAQ)

1. Name any four hypothalamic hormones.
2. Name the anterior pituitary (Adenohypophysis) hormones.
3. List the posterior pituitary (Neurohypophysis) hormones
4. What is diabetes mellitus? What are its types?
5. What is the difference between gigantism and agromegaly?
6. What is dwarfism?
7. Name the thyroid hormones.
8. Write any two functions of thyroid hormones.
9. What is Grave's disease?
10. What is myxedema?
11. What is cretinism?
12. What is the difference between myxedema and cretinism?
13. Functions of parathormone.
14. Functions of mineralocorticoids (Aldosterone).
15. Functions of glucocorticoids.
16. What is Cushing's syndrome?
17. What is Addison's disease?
18. What is the difference between diabetes mellitus and diabetes insipidus?
19. Name the hormones secreted by pancrease.
20. Name the diabetogenic and antidiabetogenic hormones.
21. Functions of insulin.
22. Functions of glucagon.
23. What is diuresis? What are its types?
24. Functions of adrenal medullary hormone.
25. What is fight or flight response?

V- REPRODUCTIVE SYSTEM

Short answer questions (SAQ)

1. What is spermatogenesis? Mention its stages.
2. Briefly explain the ovarian cycle.
3. Briefly explain ovulation with hormonal regulations.
4. What is menstrual cycle? Briefly explain its phases.
5. Briefly explain any two female contraceptive methods.
6. List the contraceptive methods in male and female.
7. Explain the IUCD (Intrauterine contraceptive device).
8. List the functions of estrogen.
9. List the functions of progesterone.

Very short answer questions (VSAQ)

1. Write any two functions of testosterone.
2. What is menarche and menopause?
3. What is menstrual cycle?
4. List the placental hormones.
5. List the functions of Follicular stimulating hormone (FSH).

6. List the functions of sertoli cells
7. Functions of placenta.
8. Name the factors influencing spermatogenesis.
9. What is fertilization?

UNIT – VI
NERVE MUSCLE PHYSIOLOGY

Short answer questions (SAQ)

1. Draw the labeled diagram of neuromuscular junction (NMJ).
2. Briefly explain the ionic basis of action potential in a neuron.
3. Briefly explain the steps of neuromuscular transmission of signal impulse.
4. With the help of a flow chart, depict the steps of muscle contraction.
5. Briefly explain the excitation – contraction coupling in a skeletal muscle
6. Write any four differences between skeletal, cardiac and smooth muscles.
7. Myasthenia gravis

Very short answer questions (VSAQ)

1. Describe the structure of a neuron.
2. Give the normal value of resting membrane potential of i) motor neuron and ii) skeletal muscle.
3. Give normal resting membrane potential of neuron and skeletal muscle.
4. List any two properties of nerve fibers.
5. Name any two neuromuscular blocking agent
6. Draw the structure of sarcomere
7. Name the muscle proteins.
8. List any four properties of skeletal muscle.
9. Rigor mortis

VI – CENTRAL NERVOUS SYSTEM (CNS)
Short answer questions (SAQ)

1. Briefly explain the divisions of nervous system.
2. With a flow chart and suitable diagram briefly explain the synaptic transmission of excitatory postsynaptic potential (EPSP).
3. With a flow chart and suitable diagram briefly explain the synaptic transmission of inhibitory postsynaptic potential (IPSP).
4. Briefly explain the functions of cerebral cortex.
5. What are the functions of cerebellum?
6. What are the functions of basal ganglia?
7. What are the functions of hypothalamus?

Very short answer questions (VSAQ)

1. Name any four properties of synapse.
2. Write any two functions of thalamus.
3. Functions of medulla oblongata.
4. Functions of cerebro spinal fluid (CSF).
5. Name any two neurotransmitters.
6. Name any four hypothalamic hormones.
7. Name the anterior pituitary (Adenohypophysis) hormones.
8. List the posterior pituitary (Neurohypophysis) hormones

VI - SPECIAL SENSES
Short answer questions (SAQ)

1. Trace the visual pathway with a neat labeled diagram
2. Explain the errors of refraction

3. Trace the auditory pathway with a neat labeled diagram
4. Functions of Middle ear.
5. Trace the olfactory pathway.

Very short answer questions (VSAQ)

1. Name the receptors for vision, smell, taste and hearing.
2. Functions of eye
3. List the primary colors of vision
4. Accommodation reflex.
5. What are the functions of rods and cones in eye?
6. Explain the terms ageusia, hypogeusia, dysgeusia.
7. Name the primary taste sensations

PAPER-3: BIOCHEMISTRY

UNIT-I: INTRODUCTION TO BIOCHEMISTRY

Long answer questions **(10 marks)**

1. How is acid base balance maintained in the body?
2. Write in detail about Acid base disorders

Short Questions **(6 marks)**

1. Discuss the different buffer system of acid base homeostasis.
2. What is the normal PH of blood? How is it maintained?
3. Explain the role of lungs in acid base system
4. Glass electrode and determination of pH
5. Explain the Metabolic acidosis & Metabolic alkalosis
6. Explain the Respiratory acidosis & Respiratory alkalosis
7. Role of kidney in the regulation of blood pH
8. Biochemical assessment of acid base balance

Very Short answer questions: **(3 marks)**

1. Define pH. What is the normal values of blood & urine PH
2. Define buffer and give 2 examples.
3. Define acid/ base with example
4. Write any 2 conditions for acid base imbalance.
5. What is Henderson Hasselbalch equation
6. Define Anion gap with example
7. List out any 2 causes & symptoms for Respiratory acidosis & alkalosis
8. List out any 2 causes & symptoms for Metabolic acidosis & alkalosis
9. Define isoelectric PH.

PROTEINS

Long answer questions **(10 marks)**

1. Define proteins & detail in classification of Proteins with suitable examples
2. Describe the different levels of protein structure in detail with suitable diagram

Short Questions **(6 marks)**

1. What are Essential amino acids & mention its clinical significance
2. Mention any five biologically important peptides & its clinical role
3. Define Protein denaturation & causes, characteristics with example
4. Classify amino acids in detail with example.
5. Explain Transamination & Give one example.
6. Functions of plasma proteins
7. Define Electrophoresis & its clinical significance
8. Define Chromatography & its clinical significance
9. Explain the secondary structural organization of proteins
10. Mention the hydrolytic products of proteins
11. Precipitation reactions of protein
12. Define peptide bond formation & characteristics of peptide bond
14. Determination protein structure
15. Biological functions of amino acids16 Biological functions of proteins.

Very Short answer questions: **(3 marks)**

1. Name any 4 agents causing denaturation of protein
2. Name any 2 defense & buffer proteins
3. Name the Sulphur containing essential amino acid & functions.
4. Explain oxidative deamination with example
5. Explain decarboxylation with example
6. Mention the Properties of proteins
7. Name the conjugated protein with example
8. Name the derived protein with example
9. Define A:G ratio
10. Nutritional classes of proteins with example
11. Define zwitterion
12. Fibrous & globular proteins

ENZYMES

Long answer questions **(10 marks)**

1. Classify enzymes? Explain any 4 factors affecting the enzymes activity
2. Explain the different types of enzyme inhibition with suitable examples

Short Notes **(6 marks)**

1. How are enzymes classified and give one example for each class?
2. Explain factors affecting enzyme activity
3. Mention the clinical applications of enzymes and how they are useful in diagnosis ofdisease
4. Explain the features of active site of enzyme
5. Explain the competitive inhibition with suitable example
6. Explain the non-competitive inhibition with suitable example
7. What are the Co enzymes & Explain the features with example
8. Explain the regulation of enzyme activity
9. Define Iso-enzyme? Give two examples and its importance in clinical diagnosis
10. Explain the types of specificity

Very Short answer questions **(3 marks)**

1. Define Enzymes & Catalyst
2. Define Active site
3. What is Co- enzymes, mention any 2 examples with significance.
4. Define Enzyme unit
5. Define Apo enzyme & Holoenzymes
6. What is Suicide Inhibition
7. List any 3 Therapeutic uses of enzymes.
8. Plasma enzymes
9. Define km
10. Koshland's induced fit theory
11. Fischer's template theory
12. Prosthetic groups
13. Examples of Metalloenzymes & Metal activated enzymes

UNIT II – CARBOHYDRATES

Long answer questions **(10 marks)**

1. Write in detail about the Polysaccharides and mention its importance.
2. Properties of Monosaccharides
3. Define Carbohydrates & detail in classification of carbohydrates with examples
4. Explain the reaction of Monosaccharides.

Short Questions **(6 marks)**

1. Define carbohydrate and classify with examples
2. Write a note on Mucopolysaccharides & mention one function of each
3. Differentiate between Glycogen and Starch
4. Define Mutarotation
5. List out the functions of carbohydrates
6. Explain the Clinical importance of monosaccharides
7. Properties of monosaccharides
8. Explain Homopolysaccharides & mention their function
9. Write a note on Disaccharides
10. Define glycosides? Name any 3 glycosides & mention their function

Very Short answer questions **(3marks)**

1. What is heparin? Mention its composition & function
2. List any 2 reducing sugars
3. List any 4 functions of glycoprotein
4. Difference between glycoprotein & proteoglycan
5. Why is sucrose a non-reducing sugar
6. Mention the clinical application of Inulin & Dextran
7. Difference between reducing and non-reducing sugars
8. Define invert sugar
9. What is cellulose? Mention its function
10. Note on Anomers
11. Define Epimers with examples
12. Biological importance of mannitol
13. Optical isomerism with examples.
14. Define amino sugars with examples
15. Define glycosides

NUCLEIC CHEMISTRY

Short Answer Questions **(6 marks)**

1. List any 5 synthetic analog bases and mention its function
2. Short notes on types of RNA & mention its function
3. Define nucleoside and nucleotide by giving suitable examples.
4. Describe the structure of t-RNA and mention its function
5. List the important functions of nucleotides
6. Give a detailed account on Secondary structure of DNA
7. Difference between DNA and RNA
8. Difference between Purines and Pyrimidines

Very Short Answer Questions **(3 marks)**

1. Name the purine and pyrimidine bases of DNA & RNA
2. Differentiate Ribose and Deoxy ribose.
3. Name any 4 minor bases
4. Draw a neat labeled diagram of DNA
5. Mention the types of DNA and give 3 points each
6. What are the biological important bases and its function
7. Define Chargaff's rule
8. Functions of nucleic acid
9. What is ribosomal RNA
10. Draw a neat labeled diagram of t-RNA

UNIT III - LIPIDS

Long answer questions **(10 marks)**

1. what are lipids? classify them. Give biological significance of lipids.
2. what are fatty acids? classify them. Give biological significance of polyunsaturated fattyacids
3. Explain the phospholipids with examples and its function.

Short Questions **(6 marks)**

1. Explain in detail about Sphingomyelins & their function
2. Write a short note on Micelles, Bio membranes
3. Write a short note on Sphingophospholipids
4. Write a short note on Liposomes
5. Write a short note on Triacylglycerol
6. What is saturated fatty acid and give three examples with biological significance
7. What are prostaglandins? Mention their function
8. What is unsaturated fatty acid? Explain the types and biological significance
9. Write a short note on Properties of fatty acids
10. Write a short note on Essential Fatty Acids?
11. Write a short note on Trans fatty acids
12. Write a short note on cholesterol
13. Describe briefly about the classifications of lipids with suitable examples
14. What are the compounds formed from cholesterol?
15. Write in detail about the lipoprotein & its functions

Very Short answer questions **(3 marks)**

1. Lung surfactant
2. Saponification number
3. Iodine number
4. Acid number
5. What are Apo Lipoproteins?
6. Respiratory Distress Syndrome (RDS)
7. Define halogenation
8. What is rancidity of lipids?
9. Omega 3 Fatty acids
10. Cardiolipin
11. Free Fatty Acids

12. Leukotriene's (LTs)
13. Thromboxane's (Tx)
14. Write the products formed due to complete hydrolysis of triacylglycerol
15. What is cephalin

UNIT IV - ENGERY METABOLISM AND NUTRITIONAL BIOCHEMISTRY

Long answer questions **(10 marks)**

1. Write in detail about the RDA, dietary sources, biochemical role and deficiency manifestations of folic acid/ vitamin B12/ calcium /lron
2. Explain the RDA, dietary sources, biochemical role and deficiency manifestations ofvitamin A/ vitamin D/ vitamin C/ vitamin K

Short Notes **(6 marks)**

1. List out the clinical significance of Vitamin E/ Vitamin K
2. Coenzymes & functions of any 1 B-complex vitamin (Thiamine/ Riboflavin/ Niacin/Pyridoxine/ Folic acid etc.)
3. Explain the Vitamin E has selenium sparing action.
4. Discuss the steps involved in digestion & absorption of calcium/ phosphorous / iron
5. How plasma calcium level is regulated
6. Functions of copper/ selenium/ zinc
7. Role of proteins in diets
8. Describe protein energy malnutrition
9. Nutritional value of protein
10. Dietary role of different lipids
11. Dietary fiber
12. Thermogenic effect of food
13. Obesity
14. Define nitrogen balance & Mention the factor that causes positive & negative nitrogenbalance
15. Define BMR & factor affecting BMR
16. What are Essential Amin Acids? Mention their clinical importance
17. Explain the RDA, sources, biochemical role and deficiency of sodium / potassium
18. What are Essential Fatty Acids? Mention their clinical importance.

Very Short answer questions **(3marks)**

1. Write any 3 causes for Tetany
2. Define Heme proteins/ non heme proteins
3. Hemochromatosis/ Hemosiderosis
4. Iron deficiency anemia
5. Wilson's disease
6. Fluorosis
7. Define balanced diet
8. Define calorific values & Its significance
9. Define Respiratory quotient
10. What is Glycemic index
11. What is pellagra
12. Ceruloplasmin

UNIT V CLINICAL CHEMISTRY

Short Notes **(6marks)**

1. Detail account on basic principle, methodology and diagnostic significance of electrophoresis.
2. Detail account on basic principle, methodology and diagnostic significance of paperchromatography
3. Short notes on Osmolality, significance and measurement.
4. write about the different types of electrophoresis & application of each type
5. Explain the method of cholesterol /urea /glucose estimation
6. write about the different types of electrophoresis & application of each type

Very Short answer questions **(2 marks)**

1. Define Osmolality/ Osmolarity
2. Write the principle of (GOD-POD) method
3. List any 3 simple test to identify Carbohydrates, lipids and proteins
4. Mention the normal values of glucose/ cholesterol/ protein/ urea/ creatinine
5. Define osmolal gap
6. what is Rf value
7. Write the principle of Molisch test /Benedict's test
8. List out the normal/ abnormal constituents of urine

ENVIRONMENTAL CHEMISTRY

Short Notes **(6 marks)**

1. Explain in detail about biomedical waste management
2. Write short notes on air pollution
3. Write short notes on Acid Rain.
4. Write short notes on carbon monoxide
5. Write short notes on mutagenesis.
6. Explain in detail about bio pesticides & its types
7. Explain briefly about the harm full effects of plastics to human health

Very Short answer questions **(3marks)**

1. Define pollutants & give 2 examples
2. What are biomedical wastes?
3. Name five categories of bio pesticides
4. Write about biological water borne disease
5. What are the problems caused by plastics?
6. Name some chemicals causing water borne disorders
7. What is Bio-degradable & Non-biodegradable Waste?
8. Define greenhouse effects
9. What is Ames test?
10. What is meant by carcinogens, and list any three chemicals causing carcinogens
11. What is biosafety?

PAPER 4A - GENERAL MICROBIOLOGY

UNIT –I : GENERAL BACTERIOLOGY

10 MARKS

1. Discuss the methods of collection and transportation of specimens.
2. Define the terms sterilization,disinfection and antisepsis.Name various agents used for sterilization and discuss the role of hot air oven in sterilization.
3. Define the terms sterilization. Discuss the role of moist heat in sterilization and their sterility control methods.
4. Discuss the various types of disinfectants and discuss the role of halogens in chemical disinfection.

6 MARKS

1. Write a short note on contribution of Louis Pasteur.
2. Write a short note on contribution of Robert Koch.
3. Write a short note on contribution of Edward Jenner.
4. Write a short note on Koch postulates.
5. Tabulate the difference between prokaryotes and Eukaryotes .
6. Draw a labeled diagram of a bacterial cell. Describe the cell wall of bacteria.
7. Draw a labeled diagram of Autoclave. Describe the structure and functioning.
8. Draw a labeled diagram of Hot air oven. Describe the structure and functioning.
9. Tabulate the difference between differentiate between flagella and fimbria .
10. Write a short note on spores.
11. Describe bacterial growth curve.
12. What are culture media? Classify and discuss them in brief.
13. Discuss in detail anaerobic methods of cultivation of bacteria.
14. Discuss the methods of preservation of microorganisms.
15. Write a short note on phenols as disinfectant.
16. Write a short note on Aldehydes as disinfectant.
17. Write a short note on Antimicrobial sensitivity testing.
18. Discuss the methods of collection and transportation of specimens.
19. Outline the steps in Gram staining and interpretation.
20. Outline Ziehl-Neelsen staining procedure and interpretation.
21. Name the different types of hospital wastes and discuss in detail the methods of disposal of hospital wastes

3 MARKS

1. Write four functions of bacterial cell wall.
2. Write four differences between gram positive & gram negative bacterial cell wall.
3. What is protoplast & spheroplast.
4. What are the functions of capsule.
5. How will you classify bacteria based on position of flagella.
6. Write four examples of spore producing bacteria.
7. Write four examples of capsule producing bacteria.
8. Write four examples of capnophilic bacteria.
9. Write four examples of strict aerobic bacteria.
10. Write four examples of strict anaerobic bacteria.

11. Write four examples of microaerophilic bacteria.
12. Define sterilization .
13. Define disinfectant .
14. Name the types of filters and their uses.
15. What is cold sterilization.
16. Define inspissation.
17. What is an agar? write its role in preparation of media.
18. Name four selective media.
19. Name four differential media.
20. Name four transport media.
21. Write the composition of TSI agar.
22. Write the principles of catalse test.
23. Write the principles of oxidase test.
24. Name the two motile and non-motile organisms

UNIT -2 : IMMUNOLOGY

6 MARKS

1. Discuss the mechanism of innate and acquired immunity.
2. What is hypersensitivity? Classify hypersensitivity reactions? Describe in detail about type I reactions.
3. Discuss the principle and clinical applications of immunofluorescence technique.
4. Discuss the principle and clinical applications of ELISA technique.
5. Describe the structure and functions of Ig M, Ig G & Ig A.
6. Write a short notes on autoimmunity.
7. Discuss about delayed type hypersensitivity.
8. Describe about phagocytosis process.
9. Herd immunity.
10. Type III Hypersensitivity.

3 MARKS

1. Write the difference between active & passive immunity.
2. Define Immunity.
3. Write two examples of each , live attenuated bacterial & viral vaccines.
4. Write two examples of each , killed bacterial & viral vaccines
5. Write four difference between live & killed vaccines.
6. Define hapten.
7. What is heterophile antigen? write two examples.
8. Write two uses of ELISA.
9. Define hypersensitivity.
10. Difference between immediate and delayed type of hypersensitivity.
11. Define autoimmunity

UNIT -3 SYSTEMIC BACTERIOLOGY

10 MARKS

1. Discuss the pathogenicity and laboratory diagnosis of *Staphylococcus aureus*.
2. Name various organism causing sore throat and discuss in detail the laboratory diagnosis of diphtheria.
3. Classify Streptococci. Discuss the pathogenesis and lab diagnosis of *S.pyogenes*.

4. Classify the Clostridia of medical importance. Describe the pathogenesis, laboratory diagnosis of gas gangrene.
5. Classify Mycobacteria. Give an account on pathogenesis and laboratory diagnosis of pulmonary tuberculosis. Add a note on BCG vaccine.
6. Discuss the morphology, pathogenesis and laboratory diagnosis of syphilis.
7. Discuss in detail about pathogenesis and laboratory diagnosis of enteric fever.
8. List the diarrhea causing bacteria. Write in detail about pathogenesis and laboratory diagnosis of *vibrio*.

6 MARKS

1. Name four causative agents of enteric fever and explain about WIDAL test.
2. Name the UTI causing bacteria. How to collect urine & laboratory diagnosis of *E.coli*.
3. Describe about Toxin produced by *staphylococcus aureus*.
4. Discuss about prophylaxis of diphtheria.
5. Difference between *Streptococcus viridians* & *Streptococcus pneumoniae*.
6. Coagulase test.
7. Tetanus.
8. Explain about morphology and pathogenicity of *Bacillus anthracis*.
9. Classification of shigella and explain the antigenic structure and toxins produced by *Shigella*.
10. Weil's diseases.
11. Laboratory diagnosis of syphilis
12. Discuss the pathogenicity of Chlamydia.

3 MARKS

1. Name the pigments produced by *Pseudomonas*.
2. Name two toxins produced by *Clostridium tetani*.
3. Define Asepsis.
4. Enumerate any four diseases caused by *Streptococcus pyogenes*. 5. Gas gangrene.
6. Name four first line drugs used to treat tuberculosis infections.
7. List four species of *Shigella*.
8. List the cultivation methods of leprae.
9. MRSA.
10. ASO
11. CRP
12. Non –gonococcal urethritis (NGU).
13. Name two selective media for V.cholera
14. Significant bacteriuria.
15. Meningitis .
16. Selective medium of Salmonella
17. VDRL and RPR.
18. Name two transport and enrichment media for *V.cholerae*.
19. What are coliform bacilli? write two examples.
20. Actinomycosis
21. List the atypical mycobacteria.
22. Ghon's focus.
23. BCG vaccine
24. Name the two beta hemolytic bacteria.

25. Mantoux test.

UNIT -4 : VIROLOGY

10 MARKS

1. Name two RNA viruses.Name four methods of transmission of Hepatitis B virus infection in man.Mention the schedule of Hepatitis B vaccination.
2. Mention the modes of transmission of HIV in humans.Draw a neat diagram of HIV and label the parts.List the tests available for the confirmation of HIV in the microbiology laboratory.
3. Describe the laboratory diagnosis and prophylaxis of poliomyelitis.
4. Explain the laboratory diagnosis and prophylaxis of Rabies.

6 MARKS

1. Describe the serological markers of Hepatitis B virus.
2. Describe the prophylaxis of polio virus.
3. Complications of dengue virus.
4. Write a short note on adenovirus.
5. Infectious mononucleosis.
6. List the opportunistic infections in AIDS patient.

3 MARKS

1. Name four DNA virus.
2. Name four RNA virus
3. Haemorrhagic causing virus.
4. MMR vaccine.
5. Draw a neat labeled diagram of HIV.
6. Rabies vaccine.
7. List the cultivation methods of virus.

UNIT -5: PARASITOLOGY

6 MARKS

1. Difference between amoebic and bacillary dysentery.
2. Describe the life cycle of *Entamoeba histolytica*.
3. Describe the life cycle of *Giardia lamblia*
4. Describe the life cycle of *Malaria*
5. Describe the life cycle of *hookworm*
6. Describe the life cycle of *Roundworm*
7. Lab diagnosis of Plasmodium.
8. Describe the lab diagnosis of parasitological samples.

3 MARKS

1. Morphology of *E.histolytica*.
2. Black water fever.
3. Vectors.
4. Morphology of Leishmania.
5. Peripheral blood smear of Malaria.
6. Dog tapeworm.
7. Cysticercus bovis.
8. Cysticercus cellulose.
9. Microfilaria.

UNIT -6: MYCOLOGY

6 MARKS

1. Discuss the laboratory diagnosis of fungal infections.
2. Write a short notes on zygomycosis.
3. Aspergillosis
4. Describe about systemic mycoses.
5. Cryptococcosis - Lesions caused & Laboratory diagnosis.
6. Discuss the opportunistic mycoses.
7. Describe the morphology & cultural characteristics of Dermatophytes.
8. Describe the morphology & cultural characteristics of *Candida albicans*

3 MARKS

1. SDA
2. Name two selective culture media for Candida spp.
3. Name two selective culture media for Cryptococcus spp.
4. What is germ tube test.
5. Mention four fungal laboratory contaminants .
6. Name four dimorphic fungus.
7. Name two examples of yeast.
8. Name four opportunistic fungus.
9. Name four superficial mycoses.
10. Mycetoma

UNIT -7: HOSPITAL INFECTION CONTROL

6 MARKS

1. Biomedical waste management.
2. Write a short note on universal precaution.
3. Write a short note on universal precaution.
4. Mode of transmission of infections.
5. Write short note on the vaccines recommended for health care workers.
6. Recall the procedure to be followed for sharp injury to health care workers.
7. Describe the prevention of Nosocomial infections.

3 MARKS

1. Define segregations.
2. List four infectious waste.
3. Define land filling.
4. What is HICC? List two roles of HICC.
5. List two techniques used for the treatment of infectious waste.
6. Define universal precautions.
7. Define PPE.
8. List four methods to control the Hospital acquired infections.

PAPER 4B - GENERAL PATHOLOGY

LONG ANSWER **(10 MARKS)**

1. Mention the types of necrosis with two example each
2. Mention the types of cellular adaptations with one example each
3. Mention the types of cell injury and describe the changes seen in each type
4. Describe the morphological alterations in reversible cell injury
5. Describe the morphological alterations in irreversible cell injury

SHORT ANSWERS **(6 MARKS)**

1. Tabulate the differences between exudate and transudate
2. Tabulate the differences between benign and malignant tumor
3. Define Gangrene. Mention the types of gangrenes with one example each
4. Mention the factors that influence wound healing and repair
5. Tabulate the differences between acute and chronic inflammation
6. Describe the principle chemical mediators of inflammation
7. Tabulate the differences between necrosis and apoptosis
8. Write a short note on apoptosis
9. Describe causes and morphological features of chronic inflammation
10. Explain granulomatous inflammation with a neat labeled diagram
11. Tabulate the differences between dry and wet gangrene
12. Explain mode of spread of tumors in brief
13. Adverse effects of smoking
14. Write a short note on asbestosis
15. Write a short note on silicosis

VERY SHORT ANSWERS **(3 MARKS)**

1. Define apoptosis. Mention two examples.
2. List the cardinal signs of acute inflammation
3. Define acute inflammation reaction and mention its outcome
4. Define chronic inflammation and give 2 examples
5. Mention the components of granulation tissue
6. Mention the parts of microscope
7. Give 2 examples of granulomatous inflammation
8. Define neoplasia
9. Define hypertrophy. Give 2 example
10. Define atrophy. Give 2 example
11. Define hyperplasia. Give 2 example
12. Define metaplasia. Give 2 example
13. Define reversible cell injury and mention two features
14. Define phagocytosis.
15. Define Virchow triad

HAEMATOLOGY

SHORT ANSWERS **(6 MARKS)**

1. Define anemia. Mention the types of anemia on the basis of etiology.
2. Classify leukemia. Mention general features of acute leukemia.
3. Enumerate various color codlings of various biomedical waste disposal with 4 examples

4. Describe the collection. transport, preservation and processing of clinical specimen
5. Describe the structure and function of different types of WBC'S with a neat labeled diagram
6. Write a short note on occupational health hazards.
7. Describe mechanism of homeostasis
8. Describe various types anticoagulant and its uses with its color coding
9. Explain microscopic examination of urine samples.
10. Describe the method of collection, transport, preservation of CSF.
11. Write short note on Coomb's test
12. Define anemia . Mention the general clinical features and basic interpretation of anemia.
13. Classify hemolytic anemia and mention in brief the laboratory findings

VERY SHORT ANSWERS **(3 MARKS)**

1. Define Landstenier's Law
2. Define blood group
3. Mention the normal platelet count and function of platelets.
4. Mention the types of transfusion transmitted infection
5. Mention 2 causes of Eosinophilia.
6. Mention 2 causes of Neutrophilia.
7. Mention 4 preservative of urine and its indication
8. Define cross matching
9. Mention Principle of major cross matching
10. Mention Principle of minor cross matching
11. Write about the principle of benedicts test.
12. Write about biomedical waste management.

SYSTEMIC PATHOLOGY

LIVER

1. Define Cirrhosis.(3M)
2. Describe in detail about viral hepatitis. (6M)
3. Mention the various stages of alcoholic liver disease(3M)
4. Describe in detail about gall stones.(6M)
5. Write about the etiology, pathogenesis and clinical features of chronic cholecystitis.(10M)

BRAIN TUMOURS

1. Classify brain tumours (3M)

KIDNEY

1. Mention the types of renal calculi.(3M)
2. Describe the clinical features of renal stones.(3M)
3. Define hydronephrosis (3M)
4. Classify renal tumours.(3M)

BONE TUMOURS

1. Classify bone tumours(3M)
2. Give two examples of benign bone tumors.(3M)
3. Give two examples of malignant bone tumours(3M)

FEMALE GENITAL TRACT

1. Classify ovarian tumours(3M)
2. Describe the types of endometrial hyperplasia and risk factors associated with it.(6M)
3. Write a short note on risk factors for endometrial cancer.(6M)
4. Describe the etiopathogenesis and risk factors for cervical cancer.(10M)

BREAST

1. Describe the risk factors and clinical features of breast carcinoma.(10M)
2. Give 2 example of benign breasts tumour (3M)
3. Give 2 example of malignant breast tumours.(3M)

CARDIOVASCULAR SYSTEM

RHEUMATIC HEART DISEASES

1. Enumerate the modified Jones criteria for rheumatic heart disease(6M)

INFECTITVE ENDOCARDITIS

1. List the causative organisms for infective endocarditis(3M)
2. Enumerate the Dukes criteria for infective endocarditis.(6M)

ARTHEROSCLEROSIS

1. Enumerate the risk factors for atherosclerosis.(6M)
2. Mention two complications of atherosclerosis (3M)\
3. Mention the types of Ishemic heart disease. (3M)
4. Write in detail about myocardial infarction. (10M)

RESPIRATORY SYSTEM

LUNG INFECTIONS

1. Describe the various Stages of Pneumonia.(6M)
2. Define Pneumonia.(6M)

COPD

1. Define emphysema.(3M)
2. Define chronic bronchitis.(3M)
3. Define broncheactasis.(3M)
4. Tabulate the differences between chronic bronchitis and emphysema.(6M)
5. Mention various systemic effects of smoking (3M)

ASTHMA

1. Describe the etiopathogenesis and clinical features of bronchial asthma.(6M)
2. Define ARDS(3M)
3. Give 2 examples for conditions associated with ARDS.(3M)

GASTROINTESTINAL SYSTEM

1. Enumerate the clinical features of peptic ulcer.(3M)
2. Describe the Risk factors and clinical features of carcinoma stomach.(10M)
3. Describe the Risk factors and clinical features of carcinoma colon.(10M)

ABILITY ENHANCEMENT COMPULSORY ELECTIVES
AECC-1- ENGLISH QUESTION BANK

UNIT-1 – GRAMMAR

Six Mark Questions

1. Define grammar, Explain the types of grammar with example.
2. What do you mean by noun and Explain its type with examples?
3. Write a brief note on types of sentences with examples.
4. How many types of tenses are there?

Two Mark Questions

1. Define verb.
2. Define Adjective with example.
3. Define Adverb with example.
4. Define Gerund and preposition.
5. What do you mean by conjunction and interjection?
6. How many types of tenses are there?
7. He Said, "My father is ill".(Change the sentence into indirect speech)
8. He said to her, "Where are you going"? (Change the sentence into indirect speech)
9. They said that they can't live without water.(change the sentence into direct speech)
10. Radha said, "I am very busy now".(Change the sentence into indirect speech)
11. She says that she is a little bit nervous.(change the sentence into direct speech)
12. You are busy, _____? (Fill the sentence with suitable question tag)
13. Helmet makes driving safe, _____? (Fill the sentence with suitable question tag)
14. Dogs cannot fly, _____? (Fill the sentence with suitable question tag)
15. She was talking, _____?(Fill the sentence with suitable question tag)
16. He won't come today____?(Fill the sentence with suitable question tag)
17. He _____ (drink)tea every morning. (Fill the sentence with suitable tense)
18. I enjoy_____(read) at a cafe.(Fill the sentence with suitable tense)
19. We_____(see) a film last night.(Fill the sentence with suitable tense)
20. They went home, after they_____(finish) their work.(Fill the sentence with suitable tense)
21. I_____(stay) here till you return.(Fill the sentence with suitable tense)
22. I_____ do it tomorrow. (Fill the sentence with modal verb)
23. _____ you help me with the house work, please? (Fill the sentence with modal verb)
24. I _____ speak English.(Fill the sentence with modal verb)
25. The doctor_____ see you now.(Fill the sentence with modal verb)
26. He _____ be the love of my life.(Fill the sentence with modal verb)
27. All_____ submit your notebook.(Fill the sentence with modal verb)
28. Seetha loves Rama. (Change the sentence to passive voice)
29. The story has been read by me. (Change the sentence to active voice)
30. Do you speak English well? (Change the sentence to passive voice)
31. Open the door (Change the sentence to passive voice)
32. Let the T.V be watched by them. (Change into active voice)
33. He admitted his guilt. (Change the simple sentence into complex sentence)
34. In-spite of his hard work, he failed. (Change the simple sentence into compound sentence)

35. It was raining, but they went out. (Change the compound sentence into simple sentence)
36. He failed to prove that he was innocent. (Chance the complex sentence into simple sentence)
37. If you do not work hard, you will fail. (Change the complex sentence into compound sentence)
38. Everest is _____ highest mountain in the world. (Fill up with the suitable article)
39. The rose is _____ beautiful flower. (Fill up with the suitable article)
40. _____ umbrella is useful in rain. (Fill up with the suitable article)
41. Do you paly _____ Piano? (Fill up with the suitable article)
42. _____ unicorn is a special creature. (Fill up with the suitable article)
43. Red _____ danger. (Fill up with suitable prepositions)
44. I acted _____him. (Fill up with suitable prepositions)
45. Mr. Kumar is _____ the office. (Fill up with suitable prepositions)
46. I am ready _____ help. (Fill up with suitable prepositions)
47. Put it _____ (Fill up with suitable prepositions)
48. Bharath is the cleverest of all the boys in the class. (Identify the degrees of comparison)
49. Seetha is taller than Geetha.(Identify the degrees of comparison)
50. Hyderabad is not so hot as Chennai.(Identify the degrees of comparison)
51. I am not so strong as he. (Identify the degrees of comparison)
52. Mumbai is bigger than Hyderabad. (Identify the degrees of comparison)

UNIT-2 : VOCABULARY

Six Mark Questions

1. Define vocabulary and explain its types.
2. How to improve our vocabulary.
3. Write the uses of Dictionary.

Two Mark Questions

1. Use a prefix to make the word meaningful:
Possible
2. Use a prefix to make the word meaningful:
Legal
3. Use a suffix to make the word meaningful:
Beauty
4. Use a suffix to make the word meaningful:
Clever
5. Use a suffix to make the word meaningful:
Danger
6. Give the antonym:
Weak
7. Give the antonym:
Open
8. Give the antonym:
Narrow
9. Give the antonym:
Expand
10. Give the antonym:
Superior

11. Give the synonym:
Incredible
12. Give the synonym:
Ecstatic
13. Give the synonym:
Rest
14. Give the synonym:
Behavior
15. Give the synonym:
Tired
16. Use the following idioms / phrases into sentence:
In black and white
17. Use the following idioms / phrases into sentence:
Get away
18. Use the following idioms / phrases into sentence:
Come forward
19. Use the following idioms / phrases into sentence:
Break down
20. Use the following idioms / phrases into sentence:
Look after someone
21. Write any two words miss used or confused?
22. Define Homophones.
23. Use the homophonic words in the sentences.
Write & right
24. Use the homophonic words in the sentences.
Whole & hole
25. Use the homophonic words in the sentences.
Weight & wait
26. Use the homophonic words in the sentences.
Sell & cell
27. Use the homophonic words in the sentences.
Sum & some

UNIT-3 : WRITING SKILLS
(Six Mark Questions)

1. Make a precise of the following passage and suggest a heading:

Effective speaking depends on effective listening. It takes energy to concentrate on hearing and to concentrate on understanding what has been heard. Incompetent listeners fail in a number of ways. First, they may drift. Their attention drifts from what the speaker is saying. Second, they may counter. They find counter-arguments to whatever a speaker may be saying. Third, they compete. Then, they filter. They exclude from their understanding those parts of the message which do not readily fit with their own frame of reference. Finally, they react. They let personal feelings about a speaker or subject override the significance of the message which is being sent.What can a listener do to be more effective? The first key to effective listening is the art of concentration. If a listener positively wishes to concentrate on receiving a message his chances of success are high. It may need determination. Some speakers are difficult to follow, either because of voice problems or because of the form in which they send a message. There is then a particular need for the determination of a listener to concentrate on what is being said.Concentration is helped by alertness. Mental alertness is helped by physical alertness. It is not simply physical fitness, but also positioning of the body, the limbs and the head. Some people also find it helpful to their concentration if they hold the head slightly to one side. One

useful way for achieving this is intensive note-taking, by trying to capture the critical headings and sub-headings the speaker is referring to. Note-taking has been recommended as an aid to the listener. It also helps the speaker. It gives him confidence when he sees that listeners are sufficiently interested to take notes; the patterns of eye-contact when the note-taker looks up can be very positive; and the speaker's timing is aided-he can see when a note-taker is writing hard and can then make effective use of pauses. Posture too is important. Consider the impact made by a less competent listener who pushes his chair backwards and slouches. An upright posture helps a listener's concentration. At the same time it is seen by the speaker to be a positive feature amongst his listeners. Effective listening skills have an impact on both the listener and the speaker.

2. **Make a precise of the following passage and suggest a heading:**

Despite all the research every one of us catches cold and most of us catch it frequently. Our failure to control one of the commonest of all ailments sometimes seems ridiculous. Medical science regularly practises transplant surgery and has rid whole countries of such killing diseases as Typhus and the Plague. But the problem of common cold is unusually difficult and much has yet to be done to solve it. It is known that a cold is caused by one of a number of viral infections that affect the lining of the nose and other passages leading to the lungs but the confusing variety of viruses makes study and remedy very difficult. It was shown in 1960 that many typical colds in adults are caused by one or the other of a family of viruses known as rhinoviruses, yet there still remain many colds for which no virus has as yet been isolated.There is also the difficulty that because they are so much smaller than the bacteria which cause many other infections, viruses cannot be seen with ordinary microscopes. Nor can they be cultivated easily in the bacteriologist's laboratory, since they only grow within the living cells of animals or plants. An important recent step forward, however, is the development of the technique of tissue culture, in which bits of animal tissue are enabled to go on living and to multiply independently of the body. This has greatly aided virus research and has led to the discovery of a large number of viruses. Their existence had previously been not only unknown but even unsuspected.The fact that we can catch a cold repeatedly creates another difficulty. Usually, a virus strikes only once and leaves the victim immune to further attacks. Still, we do not gain immunity from colds. Why? It may possibly be due to the fact that while other viruses get into the bloodstream where anti-bodies can oppose them, the viruses causing cold attack cells only on the surface. Or it may be that immunity from one of the many different viruses does not guarantee protection from all the others. It seems, therefore, that we are likely to have to suffer colds for some time yet.

3. **Make a precise of the following passage and suggest a heading:**

There is nothing more frustrating than when you sit down at your table to study with the sincerest of intentions and instead of being able to finish the task at hand, you find your thoughts wandering. However, there are certain techniques that you can use to enhance your concentration. "Your concentration level depends on a number of factors," says Samuel Ghosh, a social counsellor. "In order to develop your concentration span, it is necessary to examine various 2 facets of your physical and internal environment," she adds. To begin with one should attempt to create the physical environment that is conducive to focussed thought. Whether it is the radio, TV or your noisy neighbours, identify the factors that make it difficult for you to focus. For instance, if you live in a very noisy neighbourhood, you could try to plan your study hours in a nearby library. She disagrees with the notion that people can concentrate or study in an environment with distractions like a loud television, blaring music etc. "If you are distracted

when you are attempting to focus, your attention and retention powers do not work at optimum levels," cautions Ghosh. "Not more than two of your senses should be activated at the same time," she adds. What that means is that music that sets your feet tapping is not the ideal accompaniment to your books. Also do not place your study table or desk in front of a window. "While there is no cure for a mind that wants to wander, one should try and provide as little stimulus as possible. Looking out of a window when you are trying to concentrate will invariably send your mind on a tangent," says Ghosh. The second important thing, she says, is to establish goals for oneself instead of setting a general target and then trying to accomplish what you can in a haphazard fashion. It is very important to decide what you have to finish in a given span of time. The human mind recognizes fixed goals and targets and appreciates schedules more than random thoughts. Once your thoughts and goals are in line, a focussed system will follow. She recommends that you divide your schedule into study and recreation hours. When you study, choose a mix of subjects that you enjoy and dislike and save the former for the last so that you have something to look forward to. For instance, if you enjoy verbal skill tests more than mathematical problems, then finish Maths first. Not only will you find yourself working harder, you will have a sense of achievement when you wind up. Try not to sit for more than 40 minutes at a stretch. Take a very short break to make a cup of tea or listen to a song and sit down again. Under no circumstances, should one sit for more than one and a half hours. Short breaks build your concentration and refresh your mind. However, be careful not to overdo the relaxation. It may have undesired effects.

4. **Make a precise of the following passage and suggest a heading:**

Research has shown that the human mind can process words at the rate of about 500 per minute, whereas a speaker speaks at the rate of about 150 words a minute. The difference between the two at 350 is quite large. So a speaker must make every effort to retain the attention of the audience and the listener should also be careful not to let his mind wander. Good communication calls for good listening skills. A good speaker must necessarily be a good listener. Listening starts with hearing but goes beyond. Hearing, in other words is necessary but is not a sufficient condition for listening. Listening involves hearing with attention. Listening is a process that calls for concentration. While, listening, one should also be observant. In other words, listening has to do with the ears, as well as with the eyes and the mind. Listening is to be understood as the total process that involves hearing with attention, being observant and making interpretations. Good communication is essentially an interactive process. It calls for participation and involvement. It is quite often a dialogue rather than a monologue. It is necessary to be interested and also show or make it abundantly clear that one is interested in knowing what the other person has to say. Good listening is an art that can be cultivated. It relates to skills that can be developed. A good listener knows the art of getting much more than what the speaker is trying to convey. He knows how to prompt, persuade but not to cut off or interrupt what the other person has to say. At times the speaker may or may not be coherent, articulate and well organized in his thoughts and expressions. He may have it in his mind and yet he may fail to marshal the right words while communicating his thought. Nevertheless, a good listener puts him at ease, helps him articulate and facilitates him to get across the message that he wants to convey. For listening to be effective, it is also necessary that barriers to listening are removed. Such barriers can be both physical and psychological. Physical barriers generally relate to hindrances to proper hearing whereas psychological barriers are more fundamental and relate to the interpretation and evaluation of the speaker and the message.

5. **Make a precise of the following passage and suggest a heading:**

The term dietary fibres refers collectively to indigestible carbohydrates present in plant foods. The importance of these dietary fibres came into the picture when it was observed that the people having diet rich in these fibres, had low incidence of coronary heart disease, irritable bowel syndrome, dental caries and gall stones. The foodstuffs rich in these dietary fibres are cereals and grains, legumes, fruits with seeds, citrus fruits, carrots, cabbage, green leafy vegetables, apples, melons, peaches, pears etc. These dietary fibres are not digested by the enzymes of the stomach and the small intestine whereas most of other carbohydrates like starch and sugar are digested and absorbed. The dietary fibres have the property of holding water and because of it, these get swollen and behave like a sponge as these pass through the gastrointestinal tract. The fibres add bulk to the diet and increase transit time in the gut. Some of these fibres may undergo fermentation in the colon. In recent years, it has been considered essential to have some amount of fibres in the diet. Their beneficial effects lie in preventing coronary heart disease, and decreasing cholesterol level. The fibres like gums and pectin are reported to decrease postprandial (after meals) glucose level in the blood. These types of dietary fibres are recommended for the management of certain types of diabetes. Recent studies have shown that the fenugreek (Methi) seeds, which contain 40 per cent gum, are effective in decreasing blood glucose and cholesterol levels as compared to other gum containing vegetables. Some dietary fibres increase transit time and decrease the time of release of ingested food in colon. The diet having less fibres is associated with colon cancer and the dietary fibres may play a role in decreasing the risk of it. The dietary fibres hold water so that stools are soft, bulky and readily eliminated. Therefore, high fibre intake prevents or relieves constipation. The fibres increase motility of the small intestine and the colon and by decreasing the transit time there is less time for exposure of the mucosa to harmful toxic substances. Therefore, there is a less desire to eat . and the energy intake can be maintained within the range of requirement. This phenomenon helps in keeping a check on obesity. Another reason in helping to decrease obesity is that the high-fibre diets have somewhat lower coefficients of digestibility. The dietary fibres may have some adverse effects on nutrition by binding some trace metals like calcium, magnesium, phosphorus, zinc and others and therefore preventing their proper absorption. This may pose a possibility of nutritional deficiency especially when diets contain marginal levels of mineral elements. This may become important constraints on increasing dietary fibres. It is suggested that an intake of 40 grams dietary fibres per day is desirable.

6. Write a letter to your uncle thanking him for the birthday present he had sent for you.
7. Write a letter to your mother about your daily routine.
8. Write a letter to your younger brother who has grown very weak. Suggest ways how he can improve his health.
9. Write a letter to your younger brother who has grown very weak. Suggest ways how he can improve his health.
10. Write a letter to your father requesting him to buy you a cycle.
11. Write an application to your Principal requesting him to grant leave. Also mention reason/reasons.
12. You are Nirmal/Nirmala, a student of Government High School, Gurgaon. Write an application to the Principal of your school, requesting him to allow you full fee concession.

13. Write an application to the Principal of your school to allow you to change your section.
14. You have lost your library card. Write a letter to the librarian to issue you a duplicate card.
15. Write a letter to the Chairman of the Municipal Board regarding insanitary conditions of the locality you live in.

Rearrange the following jumbled sentences to meaningful sentences:

1.are machines/to think/robots/that use/a computer brain
2.are sent/computer brain/in the robot's parts/messages/from the/to motors
3.can be/to do/of work/robots/programmed/many kinds
4.is the/computer science/concerned with/robotics/field/and engineering/creating robots

Two Mark Questions

1. How is note making important in your profession?
2. How many types of letters are there?
3. Define skimming.

UNIT-4 : SPOKEN COMMUNICATION

Six Mark Questions

1. Write a Dialogue between a shopkeeper and a customer.
2. Write a Dialogue between two friends on the topic of air pollution.
3. Write a Dialogue between two new comers in college campus.
4. Write a Dialogue between a Nurse and a doctor.
5. Write a Dialogue between a student and a teacher.
6. Why is phonetics important in studying English.
7. Write a conversation two friends discussing about the online classes.
8. Describe a brief note on group discussion.
9. What are the good qualities of debater?

Two Mark Questions

1. Write a short note on hazards of cell phone usage?
2. Describe your favorite friend.
3. Define pronunciation.
4. Define intonation.
5. Write any two words in British English and American English.
6. Define debate.

UNIT-5 : LISTENING AND READING SKILLS

Six Mark Questions

1. Read the following and answer the questions given below

   "I Have a Dream" is a public speech delivered by American civil rights activist Martin Luther King Jr. during the March on Washington for Jobs and Freedom on August 28, 1963, in which he calls for an end to racism in the United States and called for civil and economic rights. Delivered to over 250,000 civil rights supporters from the steps of the Lincoln Memorial in Washington, D.C., the speech was a defining moment of the civil rights movement.

   Beginning with a reference to the Emancipation Proclamation, which freed millions of slaves in 1863, King observes that: "one hundred years later, the Negro still is not free". Toward the end of the speech, King departed from his prepared text for a partly improvised peroration on the theme "I have a dream", prompted by Mahalia Jackson's cry: "Tell them about the dream, Martin!" In this

part of the speech, which most excited the listeners and has now become its most famous, King described his dreams of freedom and equality arising from a land of slavery and hatred. Jon Meacham writes that, "With a single phrase, Martin Luther King Jr. joined Jefferson and Lincoln in the ranks of men who've shaped modern America". The speech was ranked the top American speech of the 20th century in a 1999 poll of scholars of public address.

Q1.What issues does Martin Luther King's speech address?
1.Continuation of racism
2.End to racism and civil and economic rights
3. Civil rights
4.Civil War

Q2.What pushes King to speak: "I have a dream"?
1.He reads out the Emancipation Proclamation
2.He is prompted by Mahalia Jackson
3.he is overwhelmed by the crowd
4.Licoln had asked him to give the speech.

Q3.From the last paragraph, give one word for "to leave"
1.Departed
2. Proclamation
3.Improvised
4.Address

Q4.What is the name of martin Luther King's famed speech?
1.The Emancipation Proclamation
2.An Improvisation
3. A Peroration
4.I Have a Dream

Q5.In front of whom does King speak?
1.The civil rights supporters
2.His friends
3.Lincoln
4.The Negroes

Read the following and answer the questions given below

Conflict had existed between Spain and England since the 1570s. England wanted a share of the wealth that Spain had been taking from the lands it had claimed in the Americas.

Elizabeth I, Queen of England, encouraged her staunch admiral of the navy, Sir Francis Drake, to raid Spanish ships and towns. Though these raids were on a small scale, Drake achieved dramatic success, adding gold and silver to England's treasury and diminishing Spain's supremacy. Religious differences also caused conflict between the two countries. Whereas Spain was Roman Catholic, most of England had become Protestant. King Philip II of Spain wanted to claim the throne and make England a Catholic country again. To satisfy his ambition and also to retaliate against England's theft of his gold and silver, King Philip began to build his fleet of warships, the Spanish Armada, in January 1586.

Philip intended his fleet to be indestructible. In addition to building new warships, he marshaled 130 sailing vessels of all types and recruited more than 19,000 robust

soldiers and 8,000 sailors. Although some of his ships lacked guns and others lacked ammunition, Philip was convinced that his Armada could withstand any battle with England.

The martial Armada set sail from Lisbon, Portugal, on May 9, 1588, but bad weather forced it back to port. The voyage resumed on July 22 after the weather became more stable.

The Spanish fleet met the smaller, faster, and more maneuverable English ships in battle off the coast of Plymouth, England, first on July 31 and again on August 2. The two battles left Spain vulnerable, having lost several ships and with its ammunition depleted. On August 7, while the Armada lay at anchor on the French side of the Strait of Dover, England sent eight burning ships into the midst of the Spanish fleet to set it on fire. Blocked on one side, the Spanish ships could only drift away, their crews in panic and disorder. Before the Armada could regroup, the English attacked again on August 8.

Although the Spaniards made a valiant effort to fight back, the fleet suffered extensive damage. During the eight hours of battle, the Armada drifted perilously close to the rocky coastline. At the moment when it seemed that the Spanish ships would be driven onto the English shore, the wind shifted, and the Armada drifted out into the North Sea. The Spaniards recognized the superiority of the English fleet and returned home, defeated.

Q1.Sir Francis Drake added wealth to the treasury and diminished Spain's ___.
unlimited power
unrestricted growth
territory
treaties

Q2. King Philip recruited many __ soldiers and sailors.
warlike
strong
accomplished
timid
inexperienced

Q3. The __ Armada set sail on May 9, 1588.
complete
warlike
independent
isolated

Q4. The two battles left the Spanish fleet ___.
open to change
triumphant
open to attack
defeated
discouraged

Q5. The Armada was __ on one side.
closed off
damaged
alone
circled

2. Read the following and answer the questions given below

Opera refers to a dramatic art form, originating in Europe, in which the emotional content is conveyed to the audience as much through music, both vocal and

instrumental, as it is through the lyrics. By contrast, in musical theater an actor's dramatic performance is primary, and the music plays a lesser role. The drama in opera is presented using the primary elements of theater such as scenery, costumes, and acting. However, the words of the opera, or libretto, are sung rather than spoken. The singers are accompanied by a musical ensemble ranging from a small instrumental ensemble to a full symphonic orchestra.

1. It is pointed out in the reading that opera ----.
   A) has developed under the influence of musical theater
   B) is a drama sung with the accompaniment of an orchestra
   C) is not a high-budget production
   D) is often performed in Europe
   E) is the most complex of all the performing arts

2. We can understand from the reading that ----.
   A) people are captivated more by opera than musical theater
   B) drama in opera is more important than the music
   C) orchestras in operas can vary considerably in size
   D) musical theater relies above all on music
   E) there is argument over whether the music is important or the words in opera

3. It is stated in the reading that ----.
   A) acting and costumes are secondary to music in musical theater
   B) many people find musical theater more captivating than opera
   C) music in musical theater is not as important as it is in opera
   D) an opera requires a huge orchestra as well as a large choir
   E) opera doesn't have any properties in common with musical theater.

Read the following passage and answer the questions given below.

Dolphins are regarded as the friendliest creatures in the sea and stories of them helping drowning sailors have been common since Roman times. The more we learn about dolphins, the more we realize that their society is more complex than people previously imagined. They look after other dolphins when they are ill, care for pregnant mothers and protect the weakest in the community, as we do. Some scientists have suggested that dolphins have a language but it is much more probable that they communicate with each other without needing words. Could any of these mammals be more intelligent than man? Certainly the most common argument in favor of man's superiority over them that we can kill them more easily than they can kill us is the least satisfactory. On the contrary, the more we discover about these remarkable creatures, the less we appear superior when we destroy them.

1. It is clear from the passage that dolphins ----.
A) don't want to be with us as much as we want to be with them
B) are proven to be less intelligent than once thought
C) have a reputation for being friendly to humans
D) are the most powerful creatures that live in the oceans
E) are capable of learning a language and communicating with humans

2. The fact that the writer of the passage thinks that we can kill dolphins more easily than they can kill us ----.

A) means that they are better adapted to their environment than we are
B) shows that dolphins have a very sophisticated form of communication
C) proves that dolphins are not the most intelligent species at sea
D) does not mean that we are superior to them
E) proves that Dolphins have linguistic skills far beyond what we previously thought

3. One can infer from the reading that ----.
A) dolphins are quite abundant in some areas of the world
B) communication is the most fascinating aspect of the dolphins
C) dolphins have skills that no other living creatures have such as the ability to think
D) it is not usual for dolphins to communicate with each other
E) dolphins have some social traits that are similar to those of humans.

Read the following and answer the questions given below.

Naval architects never claim that a ship is unsinkable, but the sinking of the passenger-and-car ferry Estonia in the Baltic surely should have never have happened. It was well designed and carefully maintained. It carried the proper number of lifeboats. It had been thoroughly inspected the day of its fatal voyage. Yet hours later, the Estonia rolled over and sank in a cold, stormy night. It went down so quickly that most of those on board, caught in their dark, flooding cabins, had no chance to save themselves: Of those who managed to scramble overboard, only 139 survived. The rest died of hypothermia before the rescuers could pluck them from the cold sea. The final death toll amounted to 912 souls. However, there were an unpleasant number of questions about why the Estonia sank and why so many survivors were men in the prime of life, while most of the dead were women, children and the elderly.

1. One can understand from the reading that ----.
A) the lifesaving equipment did not work well and lifeboats could not be lowered
B) design faults and incompetent crew contributed to the sinking of the Estonia ferry
C) 139 people managed to leave the vessel but died in freezing water
D) naval architects claimed that the Estonia was unsinkable
E) most victims were trapped inside the boat as they were in their cabins

2. It is clear from the passage that the survivors of the accident ----.
A) helped one another to overcome the tragedy that had affected them all
B) were mostly young men but women, children and the elderly stood little chance
C) helped save hundreds of lives
D) are still suffering from severe post-traumatic stress disorder
E) told the investigators nothing about the accident

3. According to the passage, when the Estonia sank, ----.
A) there were only 139 passengers on board
B) few of the passengers were asleep
C) there were enough lifeboats for the number of people on board
D) faster reaction by the crew could have increased the Estonia's

chances of survival

E) all the passengers had already moved out into the open decks

6.Medical report writing.
You are a staff nurse in the psychiatry ward.Mr.Rammohan aged 40 was admitted in your ward with the complaint of Dengue .Write a report of this to your clinical instructor.

7.Medical report writing.
You are a staff nurse in the psychiatry ward.Ms.lalitha aged 34 was admitted in your ward with the complaint of Alzheimer disorder(memory loss) .Write a report of this to your clinical instructor.

8.Medical report writing.
You are a staff nurse in the psychiatry ward.Mr.Ranjith aged 50 was admitted in your ward with the complaint of Obsessive compulsive disorder .Write a report of this to your clinical instructor.

9.Medical report writing.
You are a staff nurse in the special ward.Mrs. Jaya priya aged 30 was admitted in your ward with the complaint of Diarrhea .Write a report of this to your clinical instructor.

10.Medical report writing.
You are a staff nurse in the psychiatry ward.Mr.Vijay aged 20 was admitted in your ward with the complaint of Anxiety disorder .Write a report of this to your clinical instructor.

11.Write a Comprehensive Report on the outbreak of Covid-19 in your Locality.

12.Write a Comprehensive Report on the outbreak of Malaria in your Locality.

13.Write a Comprehensive Report on the outbreak of Dengue in your Locality.

14.Write a Comprehensive Report on the outbreak of Cholera in your Locality.

15.Write a Comprehensive Report on the outbreak of Pneumonia in your Locality.

Two Mark Questions

1. How to make effective reading?
2. What are the types of reading?
3. Why medical report writing is important in your profession?
4. What are the skills you should have for successful Telephone conversation.

II YEAR

PAPER 5 -PHYSICAL OPTICS & GEOMETRICAL OPTICS PRINCIPLE OF LIGHTING

10 MARKS

1. Myopia
2. Hypermetropia
3. Astigmatism
4. Amblyopia
5. Presbyopia
6. Pseudophakia and Aphakia
7. Aniseikonia and Anisometropia
8. Refraction at single spherical surface
9. Prism diopter and prentice law
10. Thin lens,thick lens and spherocylindrical lens
11. Vergence and vertex power
12. Refraction through concave and convex surface.

FIVE MARKS

1. Thomas young experiment
2. Interference and Interferometer
3. Interference in thin films
4. Newton's ring Experiment
5. Diffraction
6. Fresnel and Fraunhofer Diffraction
7. Diffraction at circular aperture
8. Zone plate
9. Distortion
10. Emission and Absorption spectrum
11. Solar spectrum
12. UV and IR spectrum
13. Electromagnetic spectrum
14. Glare effect
15. Photoelectric effect
16. Raman's effect
17. Spectrometer
18. Simple microscope
19. Compound microscope
20. Telescope
21. Prism Diopter
22. Vergence
23. Prentice law
24. Types of lenses
25. Sphero cylindrical lenses
26. Vertex power
27. Refraction through Concave and convex surfaces
28. Chromatic aberrations
29. Spherical aberrations
30. Coma
31. Cylindrical Abeerrations
32. Myopia
33. Hypermetropia
34. Astigmatism
35. Amblyopia
36. Presbyopia

37. Pseudophakia and Aphakia
38. Aniseikonia and Anisometropia
39. Prism and refraction

TWO MARKS

1. Light
2. Light sources
3. Photometry
4. Dual nature of light
5. Newton’s corpuscular theory
6. Huygen’s wave theory
7. Double refraction
8. Theories of light
9. Nicole prism
10. Plane polarized light
11. Polarization
12. Optical activity
13. Optic axis of crystal
14. Nodal points
15. Snell’s law of refraction
16. Fermat’s principle
17. Distortion
18. Vergence
19. Biquartz
20. Solar spectrum
21. Emission and Absorption spectrum
22. Solar spectrum
23. UV and IR spectrum
24. Electromagnetic spectrum
25. Prentice law
26. Excimer laser
27. Uses of UV rays
28. Limitation of telescope
29. Advantages of Telecsope
30. Spherical lens
31. Cylindrical lens
32. Conacve lens
33. Fresnel prisms
34. Vertex power
35. Prism Diopter
36. Fraunhofer lines
37. Solar constant
38. Secondary colours
39. Primary colours
40. Direct glare
41. Disablity glare
42. Indirect glare
43. Fibre optics
44. Emmetropia
45. Ammetropia
46. Types of Myopia
47. Astigmatism
48. Amblyopia
49. Types of Amblyopia
50. Types of Astigmatism
51. FaultativeHypermetropia
52. Total hypermetropia

53. Laser Principles
54. Properties of Laser
55. Argon laser
56. Photocoagulation
57. Photoabation
58. Photodistription
59. Pats of spectrometer
60. Uses of telescope
61. Uses of Microscope
62. Uses of Spectrum
63. Aphakia
64. Aniseikonia
65. Types of Anisometropia
66. Myopia remedy
67. Magnification
68. Linear Magnification
69. Angular Magnification
70. Entrance pupil
71. Exit Pupil
72. Lens Equation.

PAPER 6- OPTOMETRIC OPTICS

10 MARKS

1. Tinted lenses and protective lenses
2. High index lenses
3. Aspheric lenses
4. ARC
5. Antifog, Mirror coatings
6. Polarising lenses
7. Lenticular lenses
8. Bifocals
9. Multifocals
10. PALs
11. Trifocals
12. Terminolgies of Bifocals
13. Pupillometer

FIVE MARKS

1. Spherical lens
2. Cylindrical lens
3. Sphero Cylindrical lens
4. Toric transposition
5. Rules for Toric Transposition
6. Vertex power and Vertex distance
7. Properties of Prism and its unit
8. Prisamtic effect
9. Prentice rule
10. Types of Prism
11. Uses of Prism
12. Glass and plastic lens material
13. Manufacturing of glass and plastic lenses
14. Mounting of lenses
15. Surfacing of lenses
16. Glazing and types
17. Lens quality inspection

18. Faults in lens material
19. Surface fault
20. Parts of frame
21. Bridge and types
22. Temple constriction
23. Endpiece construction
24. Frame types
25. Frame materials
26. Boxing system
27. Plastic and Metal frame material
28. Bifocal types
29. Advantages and Disadvantages of Bifocals
30. Trifocals
31. PALs
32. Advantages and Disadvantages of PALs
33. Hard and soft design
34. Progressive markings
35. Types of Progreesive designs
36. Troble shooting of PALs
37. ARC
38. Tinted lenses
39. Antifog lenses
40. Scratch resistant coatings
41. Mirror coatings
42. Photo chromatics
43. Polarising lenses
44. Asphric lenses
45. High index lenses
46. Protective lenses
47. Lenticular lenses
48. IPD measurement
49. Pupillometer
50. Crown glasses
51. Advantages of Prisms

TWO MARKS

1. Spherical lens
2. Cylindical lens
3. Concave lens
4. Convex lens
5. Plano convex
6. Plus meniscus
7. Minus meniscus
8. Types of Lens forms
9. Toric lens
10. Base curve
11. Simple transposition
12. Vertex power
13. Vertex distance
14. Sag formula
15. Prism
16. Prism diopter
17. Fresnel prism
18. Rimless prism
19. Slap off prism
20. Prentice rule
21. Glazing

22. Types of Glazing
23. Faults in lens surface
24. Frame parts
25. Temple types
26. Bridge types
27. Endpiece types
28. Types of plastic frame materials
29. Glass frame materials
30. Segment height
31. Segment drop
32. Datum line
33. Clipons
34. Hemianopic spectacles
35. Entropion Spectacles
36. Ptosis spectacles
37. Types of bifocals
38. K bifocals
39. D bifoacls
40. E bifoacls
41. Fused bifocals
42. Advantages and Disadvantages of Bifocals
43. Cemented Bifoacls
44. Bifoclas and types
45. Advantages and Disadvantages of PAL
46. Face form
47. Pink tint and uses
48. Yellow tint and uses
49. ARC
50. Principle of ARC
51. Uses of ARC
52. Limitations of ARC
53. Antifog and Mirror Coatings
54. Polariser
55. Photochromatics
56. Asperic lens advantages and diadvantages
57. Advantages and diadvantages of lenticular lenses
58. High index lenses
59. Pupillometer
60. Distance and near PD
61. IPD
62. Saddle bridge
63. Keyhole bridge
64. Modified saddle
65. Ridding bow temple
66. Convertible temple
67. Skull temple
68. Library temple
69. Prism dioptre
70. Grey tint and uses.

PAPER 7- OCULAR DISEASES

10 MARKS

1. Catarcat
2. Congenital and developmental cataract
3. Acquired cataract
4. Management and Complications of Cataract surgery
5. Corneal ulcers
6. Infective conjunctivitis
7. Allergic conjunctivitis
8. Corneal dystrophies
9. Non ulcerartive keratitis
10. Ectactic conditions of cornea

FIVE MARKS

1. Grades of corneal opacities
2. Corneal vascularization
3. Corneal Dystrophies
4. Herpes Zoaster
5. Mycotic corneal ulcer
6. Bacterial corneal ulcer
7. Viral corneal ulcer
8. Phlyctenualrkerato conjunctivitis
9. VKC
10. Ohthalmianenatrum
11. Allergic conjunctivitis
12. Trachoma
13. Congenital cataract
14. Acquired cataract
15. Stages of maturation
16. Management of cataract
17. Complications of cataract
18. Dry eye and evaluation
19. Ephiphora and evaluation
20. Congenital NLD obstruction
21. Adult NLD obstruction
22. Tests for Dcaryocystitis
23. Proptosis
24. Enophthalmos
25. Orbital cellulitis
26. Thyoroid eye disasease
27. Cavernous sinus thtombosis
28. Blunt trauma
29. Anterior segment trauma
30. Posterior segment trauma
31. Blindness
32. Sympathetic ophthalmitis
33. Nystagmus
34. Pupil examination
35. Ocular motility
36. Strabismus and concomitant squint
37. Incommitant squint
38. Optic atrophy
39. CRAO
40. CRVO
41. Diabetic retinopathy
42. NPDR

43. PDR
44. RP
45. ARMD
46. RD
47. Vitereous liquefaction
48. Vitreous detachment
49. Vitreous hemorrahges
50. Vitreous opacities
51. Visual field defects
52. Uveitis
53. Iridocyclitis
54. Perforated injuries

TWO MARKS

1. Blindness
2. Preventable blindeness
3. Curable blindness
4. Causes of blindeness
5. Blunt trauma
6. Traumatic lesions of blunt trauma
7. Graves ophthalmopathy
8. Enophthalmos
9. Causes of enaophthalmos
10. Exophthalmos and types
11. Proptosis and types
12. Caueses of proptosis
13. Surgical spaces of orbit
14. Tumours of eyelids
15. Lid retraction
16. Ptosis
17. Types of ptosis
18. Lagophthalmos
19. Symblepheron
20. Ectropion
21. Entropion
22. Triciasis
23. Dystichiasis
24. Madarosis
25. External hordeolum
26. Internal hordeolum
27. Chalazion
28. Stye
29. Blepharitis
30. Types of blepharitis
31. Hypermature cataract
32. Morgagnian cataract
33. Blue dot cataract
34. Rosette cataract
35. Types of congenital cataract
36. NSC
37. Coloboma
38. Uveitis
39. Types of uveitis
40. KP
41. Festooned pupil
42. Iris nodules
43. Aqueous flare

44. Synechiae
45. Episcleritis
46. Scleritis
47. Stages of scleritis
48. Signs of scleritis
49. Types of scleritis
50. Causes of episcelritis
51. Staphyloma
52. Types of staphyloma
53. Hypopyon
54. Ectopialentis
55. Congenital lid anamolies
56. Management of trichiasis
57. Pingecula.

PAPER 8- VISUAL OPTICS, OPTOMETRIC INSTRUMENTATION & EXAMINATION OF THE VISUAL SYSTEM

10 MARKS

1. Retinoscopy
2. Types and complications of retinoscopy
3. Optical Components of eye, Growth of Eye in relation to refractive errors
4. Vergence and sign convention
5. Cardinal points and Magnification
6. Spherical and Cylindrical Refracting Surface
7. Pupillometer
8. IPD measurement

FIVE MARKS

1. Vergence
2. Sign convention
3. Types of Vision charts
4. Phoropter
5. BAT and VAT
6. Optics of Ocular structure
7. Keratometry
8. Axees of Eye and angles
9. AC/A ratio
10. Emmetropiand Myopia
11. Hypermetropia
12. Aniseikonia
13. Apakia and Astigmatism
14. Pseudophakia
15. Presbyopia
16. Growth of eye in relation to refractive errors
17. Astigmatic fan test
18. Retinoscope
19. Types of Retinocope and complication
20. Effects of Spectacles in depth and Focus of filed
21. Spectacle magnification
22. Visual defects
23. HFA
24. OCT
25. Pachymetry
26. A scan
27. Slit lamp
28. Tonometry

29. Applanation
30. Schiotz tonometry
31. Indirect opthalmoscope
32. Direct ophthalmoscope
33. Topography
34. Auto refractometer
35. Bausch and lombkeratometer
36. Myopia
37. Hypermetropia
38. Astigmatism
39. Amblyopia
40. Presbyopia
41. Pseudophakia and Aphakia
42. Aniseikonia and Anisometropia
43. Snellen's chart and principle
44. Examination of eye
45. ERG
46. EOG
47. Duochrome test
48. Fundus camera
49. Synoptophore
50. Cardinal points
51. Magnification
52. UBM
53. Difference between Indirect and direct Ophthalmoscope
54. Amsler grid
55. Accomadation

TWO MARKS

1. Sign convention
2. Vergence
3. Vertex power and distance
4. Trial case
5. Trial frame
6. NFA
7. IPD
8. Advantages of pupilometer
9. Disadvantages of pupillometer
10. Axes and angles of Eye
11. Principle of keratometry
12. Optics of each part of eye
13. NPC
14. NPA
15. Amplitude of accommodation
16. Range of accomadation
17. AC/A ratio
18. Emmetropia
19. Myopia
20. Hypermetropia
21. Components of Hypermatropia
22. Types of astigmatism
23. Types of anisometropia
24. Aniseeikonia
25. Presbyopoia and its correction
26. Anamolies of accomadtion
27. Accomadation
28. Dynamic retinoscopy

29. Static retinoscopy
30. Astigmatic fan test
31. Pinhole
32. Complications of reetinocopy
33. Duochrome test
34. JCC
35. Drugs used in retinoscopy
36. Magnification
37. Vertex distance
38. Spectacle magnification
39. Effect of depth and focus field
40. Image formation in myopic and hypermetropic
41. HFA
42. Bjerrum screen
43. Perimeter and types
44. Visual field defects
45. HFA principle
46. Types of Illumination
47. Slit lamp
48. Direct illumination in slit lamp
49. Indirect illumination in slit lamp
50. Accesorries of slit lamp
51. Applanation
52. NCT
53. Principle of direct and Indirect Ophthalmocopy
54. Types of vision charts
55. Pinhole
56. Principle of Duochrome test
57. Fundus camera
58. Cardinal data
59. Amsler’s grid
60. Synoptophoree
61. Topography
62. Pupillomter.

III YEAR

PAPER 9 – BINOCULAR VISION & CONTACT LENS

UNIT 1

10 MARKS

1. Binocular single vision – Evolution and Grades
2. EOM movements, their insertion action and nerve supply.
3. Classification of Strabismus
4. Write about the Development of BSV
5. Explain about the grades and anomalies of BSV
6. Types of concomitant squint, convergent squint in detail
7. Explain divergent squint in detail
8. A.V. Phenomenon
9. Dorsal Pathway
10. Ventral Pathway
11. Visual Cortex
12. Explain Neural aspects of Binocular single vision.
13. Define nystagmus, elaborate on its etiology, types and management
14. Differences between paralytic and non-paralytic squint

6 MARKS

1. EOM – Origin, insertion and nerve supply.
2. Horopter and Panum's area.
3. Synergist, Antagonist and Yoke muscles.
4. Types of ocular movements
5. BSV definition and grades
6. Strabismus classification
7. Versiontypes
8. Pseudostrabismus
9. Laws governing ocular movement
10. Duction types
11. Synoptophore
12. Neural aspects of BSV
13. Nystagmus
14. Restrictive squint
15. Supranuclear eye movements
16. Paralytic squint

3 MARKS

1. Antagonists.
2. Yoke muscles.
3. Hyperphoria.
4. Orthophoria.
5. Synergists
6. Define nystagmus.
7. Visual distance
8. Panum's space.
9. Horopter.
10. Pseudo strabismus.
11. Contralateral Synergists
12. Contralateral Antagonists
13. Hering's law
14. Sherrington's law
15. Duction types
16. Definition of BSV
17. Grades of BSV

18. Anomaliesof BSV
19. Fusion
20. Stereopsis
21. SMP
22. Uses of BSV
23. Concomitant squint
24. Incomitant squint
25. Types of Incomitant squint
26. Phoria and Tropias
27. Esotropia
28. Divergent Squint
29. Classification of Squint
30. Paralytic Squint
31. A and V pattern
32. Neutral density filter.
33. Nystagmoid movements.
34. Strabismus fixus.
35. Name the two micromovements in supra nuclear eye movements.
36. Crowding phenomenon.
37. Anisokonia.
38. DuanesSynerome.
39. Nystagmus
40. Double elevator palsy
41. Forced duction test
42. Flicks and Drifts
43. Saccades and pursuits
44. Nerve Supply of EOM
45. Retinal Rivalry.
46. Name two sensory deprivation nystagmus.
47. Name two test for diplopia.
48. Ocular Flutters
49. Causes of down beat Nystagmus

UNIT – 2: STRABISMUS DIAGNOSIS & ARC
10 MARKS
1. Explain in detail about Retinal Correspondence, Normal Retinal Correspondence (NRC),abnormalRetinal Correspondence (ARC)
2. Write in detail about diplopia and suppression.
3. Explain about Hirschberg'sTest,cover &Uncover Test, prism bar cover test
4. What are the examination procedures to identify convergent squint
5. Amblyopia – Investigations and treatment
6. Evaluation of strabismus.
7. Nonsurgical management of strabismus.
8. Stereopsis and examination techniques to assess stereopsis.
9. Surgical management of Strabismus

6 MARKS
1. Define diplopia, types and treatment.
2. Eccentric fixation
3. ARC
4. Diplopia
5. Suppression
6. Cover – uncover test.
7. Maddox rod test.
8. Hirschberg corneal test.
9. PBCT.
10. Diplopia charting

11. Eccentric fixation
12. Hess screen
13. Forced duction test
14. Krimsky corneal reflex test
15. After image test

3 MARKS
1. Define NRC
2. ARC
3. Eccentic Fixation
4. Types of Diplopia
5. Binocular diplopia
6. Uniocular diplopia
7. Types of Binocular diplopia
8. Causes of Uniocular diplopia
9. Types of ARC
10. Anisometropia
11. Krimsky's corneal reflex.
12. R.A.F Ruler.
13. Maddox rod
14. Red and Green goggles.
15. Hirschberg's test
16. Maddox wing
17. Types of Occlusion
18. Worth – four dot test
19. Diplopia charting method
20. Uses of Atropine Refraction
21. Penalisation
22. Name the two tests for suppression.

UNIT – 3: RGP CONTACT LENS & SOFT CONTACT LENS
10 MARKS
1. Materials used in manufacturing of RGP lenses. Give the merits anddemerits of each material
2. Selection criteria and evaluation of trial lens fitting of rigid contact lensMaterials
3. Write the Fitting Guide Lines,Evaluation,post fitting follow up with RGP
4. Write in detail about Semi-soft contact lens care and maintenance.
5. List the complications of RGP lenses
6. Classify contact lenses and give their advantages and disadvantages.
7. Write about Materials, Types of CL (Conventional, Disposable& Replacement Lenses),Water Content Types of soft contact lens.
8. Explain the Fitting Guideline & Evaluation of soft contact lenses and its Post Fitting CL Follow Up
9. Write the complications of soft contact lenses.
10. FDA classification of contact lenses, give two examples for each group. For a patient with dry eye which FDA group of contact lens is suitable and why?

6 MARKS
1. Properties of an ideal contact lens material.
2. Initial patient work up before contact lens fitting.
3. Classification of contact lenses.
4. Terms used in relation to properties of contact lens materials.
5. Selection of a patient for contact lens fitting
6. Rigid Contact lens materials.
7. Symptoms of loose fit and tight fit in Rigid contact lens and the remedy.
8. What are the parameters for selection of lens from the trial set.
9. Write a short note on Evaluation of trail lens fit in RGP

10. Write about post fitting patient management in RGP
11. Write about the insertion and removal techniques of RGP lenses
12. What are the Complications of RGP lenses.
13. Write about stabilization techniques in soft toric contact lens.
14. Selection of a patient for contact lens fitting
15. Soft Contact lens materials.
16. Symptoms of loose fit and tight fit in soft contact lens and the remedy.
17. Write about stabilization techniques in soft toric contact lens.
18. List the complications of Soft contact lens. Give detail about contact
19. lens induced papillary conjunctivitis.
20. Procedure of Keratometry and soft contact lens fitting.
21. Important material properties for soft contact lens.
22. Find out the contact lens power for following prescriptions (vertex distance = 14 mm)-5.00 DSPH b) +10.00 DSPH
23. Initial patient work up for Contact lens
24. Evaluation of the trial lens fit in Soft lens
25. Write the post fitting patient management in soft lens.
26. Explain about the care and maintenance of Soft lens.
27. Explain the insertion and removal techniques of soft lens.
28. Write the difference between Rigid and Soft lens.

3 MARKS

1. Oxygen permeability.
2. Disadvantages of PMMA.
3. Parameters for good fitting of contact lens.
4. HEMA
5. Handling of contact lenses.
6. Follow up post fitting examination.
7. Follow up slit lamp examination.
8. Fitting contact lens in children.
9. Write types of semi-soft contact lens materials.
10. Types of RGP lenses.
11. Define contact lens.
12. Soft contact lens.
13. DK value.
14. Contact lens versus spectacles.
15. Water content of a contact lens.
16. Causes of decentration of soft contact lens.
17. Name the deposits on soft contact lens.
18. What is Extended wear contact lens?
19. What is Hybrid contact lens?

UNIT – 4: CL FITTING GUIDELINES FOR KERATOCONUS

10 MARKS

1.Corneal Topography
2.Explain in detail about the
▫▫Symptoms Clinical Science, categories
▫▫Fitting Rose-K Contact Lenses
▫▫Slit lamp Fitting Assessment
▫▫Ordering Contact Lenses to Lab (Parameters)
▫▫Post Fitting CL Follow Up of contact lenses for keratoconus
3.Write in detail about toric contact lens patient selection, fitting considerations and its evaluations.

6 MARKS

1.Keratometric method of fitting of RGP lenses.
2. Contact lens in patients with astigmatism

3. Extended wear lenses.
4. Disposable contact lenses.
5. Contact lens fitting in keratoconus.
6. Write about Accommodation and Convergence with contact lens.
7. Define Keratometry. Write Uses of Keratometry in contact lens fitting.
8. Write about advantages of contact lens over spectacles.
9. Write about the Contact lens fitting in Aphakia
10. Write about Contact lens fitting in Presbyopia.

3 MARKS
1. Types of bifocal contact lenses.
2. Contact lenses used for Aphakia.
3. Properties of contact lens solutions
4. Methods of cleaning a dirty lens
5. Types of contact lenses used for keratoconus.
6. Indications for toric lens
7. Uses of contact lens in Nystagmus
8. Instruments used in contact lens practice
9. Sattler's veil
10. Parts of a contact lens.
11. Spectacle refraction of a patient is -3.00 /-1.75 x 150°. He was fitted with a soft
12. Toric lens -3.00/-1.75x150°, which rotates 20° clockwise on the eye. What is the final prescription of the contact lens using LARS rule.
13. What is the power of contact lens of a +15.00 DS aphake wearing his glasses at a distance of 10mm from the corneal plane?
14. Orthokeratology.
15. Sagittal depth.
16. Hybrid lens.
17. FDA classification of contact lenses.
18. Refraction over contact lens trial (over refraction).
19. LARS rule.

UNIT – 5: THERAPEUTIC & PROSTHETIC CONTACT LENSES
10 MARKS
1.Indications and contra indications of bandage CL.
2.Bandage CL
3.Cosmetic CL & Prosthetic CL

6 Marks
1. Cosmetic contact lenses.
2. Advantages of contact lens.
3. Therapeutic contact lenses
4. Contact lenses in Aphakia
5. Optics of contact lenses
6. Terminologies in relation to contact lenses
7. Occupational uses of contact lenses
8. Types of Prosthetic contact lenses.
9.Indications and Contra Indications of Therapeutic lenses

3 MARKS
1. Therapeutic uses of contact lens.
2. Bandage contact lenses.

UNIT – 6 : CONTACT LENS CARE, COMPLICATIONS &SOLUTIONS
10 MARKS
1.Explain the
▫▫Lens care Procedure

▫▫Available Products
▫▫Special Clinic Procedure For Hard & RGP Lenses
2.Discuss about contact lens solutions, their properties and uses.
3.Discuss the optics of contact lenses.
4. Discuss about the corneal and conjunctivalcomplications of contact lens.
5. Discuss about the Care and Maintenance of Contact lenses.

6 MARKS
1. Chemical disinfections
2. Superior limbic kerato conjunctivitis
3. Contact lens solution and properties.
4. Write about the conjunctival complications of Contact lenses
5. Write about the corneal complications of CL
6. Write about the Contact lens related complications

3 MARKS
1. Name the care products used for contact lenses.
2. Parameters for an ideal preservation
3. Acanthamoeba keratitis
4. Conjunctival complications of contact lenses.
5. Stages in manufacture of contact lens.
6. Occupational uses of contact lenses.
7. Diagnostic uses of contact lenses.
8. Properties of contact lens solutions.
9. What is Multipurpose Solutions?
10. Notes on handling of contact lenses.

PAPER 10 – GLAUCOMA

UNIT – 1: EPIDEMIOLOGY,DEFINITION & CLASSIFICATION
10 Marks
1. Explain in detail about the Epidemiology of all types of Glaucoma
2. Explain in detail about the definition and classification of Glaucoma

6 Marks
1. Epidemiology of POAG and PACG
2. Write a short note on the epidemiology of Primary Glaucoma
3. Explain about the epidemiology of Secondary glaucoma
4. Write the classification of glaucoma
5. Pathogenesis of Glaucomatous of ocular damage

3 Marks
1.Role of heredity in glaucoma
2. Write the Epidemiology of PACG
3. Epidemiology of POCG and secondary glaucoma.
4. Definition of Glaucoma
5. Classification of Glaucoma

UNIT – 2: AQUEOUS HUMOR
10 Marks
1. Explain in detail about the
▫▫Aqueous Dynamics
▫▫Recording IOP & Common Methodology
2. Definition of Glaucoma. Classification of Glaucoma.Diagram& description of Aqueous Humor dynamics.

3. Define intraocular pressure. Write briefly about the methods of IOP measurement and the influencing factors

6 Marks
1. Diagram & description of angle structures.
2. Aqueous humour dynamics
3. Functions of aqueous humor.
4. Factors responsible for maintenance of IOP

3 Marks
1. Write the gradings of angle width
2. Trabecular meshwork
3. Functions of aqueous humour
4. Draw the flow chart depicting aqueous humour dynamics
5. Write the Major factors of Maintenance of IOP

UNIT – 3: GONIOSCOPY & VISUAL FIELDS
10 Marks
1. Write in detail about
▫▫How to perform the angle Study
▫▫Interpretation of gonioscopy
2. Give the principle of Gonioscopy and describe in detail the structureseen on Gonioscopy with interpretation of the results.
3.Explain about Evaluation of
▫▫Confrontation
▫▫Automated
▫▫Gold Man & HFA
▫▫Interpretation in Glaucoma patients.
4. Classify tonometer. Write in detail about applanation tonometry.
5. Give the various field defects in glaucoma with diagram.
6. Humphrey Field Analyzer (HFA).
7. Evaluation of glaucoma suspect

6 Marks
1. Draw a diagram of gonioscopic view of angle structures and give the principle of gonioscopy
2.Indications and contraindications for gonioscopy.
3.Ultrasound biomicroscopy (UBM)
4. Field defects in glaucoma.
5. Role of OCT in glaucoma.
6.RNFL protocols in Optical Coherence Tomography (OCT).
7. Schiotz Tonometry
8. Write about tonometers, with a note on Goldman applanation tonometer

3 Marks
1. Gonioscopy – Types
a. Any three advantages of Gonioscopy
b. Principle of Gonioscopy
c. Angle structures of Gonioscopy
d. Applications of Gonioscopy
2. Working principle of GoldmannApplanation Tonometer
3. Humphrey Field Analyzer
4. What is Indentation Tonometry
5. Imbert'sFicks law
6. 5.Give the names of tonometers
7. Factors responsible for maintenance of Intraocular Pressure
8. Noncontact tonometry.

9. Significance of central corneal thickness (CCT).
10. Cup disc ratio.
11. Extent of visual field in degrees.
12. Confrontation test.
13. Lamellar dot sign.
14. Baring of blind spot.
15. False positive in HFA.
16. Perkins tonometer.
17. Arcuatescotoma.
18. Water drinking test.
19. DVT
20. Isopter
21. 20.Optical Coherence Tomography (OCT).
22. Evaluation of Glaucoma suspect.
23. Central corneal thickness (CCT).

UNIT – 5: CONGENITAL GLAUCOMA
10 Marks
1. Explain about the
   Symptoms & Signs
   Investigation
   Management of Congenital glaucoma
2.Explain in detail about Childhood glaucoma.

6 MARKS
1.Signs and symptoms of congenital glaucoma
2. Management of Child hood Glaucoma
3. Explain about Primary congenital Glaucoma
4. Write the pathogenesis and clinical features of Congenital glaucoma
5. Write about the surgical management of Congenital glaucoma

3 Marks
1.Management of Childhood glaucoma
2. Buphthalmos
3. Terminology of congenital glaucoma
4. Types of Congenital glaucoma
5. Corneal signs of Congenital glaucoma

UNIT – 7: POAG & PACG
10 Marks
1. Draw and describe types of Field Defects in Primary Open Angle Glaucoma (POAG).
2. Explain in detail about
▫▫Symptoms & Signs
▫▫Investigation
▫▫Management of POAG
3. Explain in detail about
▫▫Symptoms & Signs
▫▫Investigation
▫▫Management of PACG
4. What are the stages, clinical features and management of Primary Narrow Angle Glaucoma (PNAG).
5. Write about classification of PACG

6 Marks
1. Explain about the Etiology and Pathogensesis of POAG
2. Symptoms and Signs of POAG

3. Optic nerve head damages of POAG
4. DVT
5. Visual field defects in POAG
6. Investigations and Management of POAG
7. Normal tension Glaucoma
8. Ocular hypertension.
9. Factors responsible for maintenance of Intraocular Pressure.
10. Stages of Primary Narrow Angle Glaucoma (PNAG).
11. PACG
12. Management of PACG
13. Evaluation of PACG
14. Write about the Phaco mechanisms of PACG
15. Pupillary block
16. Plateau iris and Phacomorphic mechanism
17. Primary angle closure suspect
18. Primary angle closure and management
19. Primary angle closure glaucoma
20. Absolute glaucoma

3 Marks
1. Pathogenesis of POAG
2. Signs of POAG
3. IOP changes in POAG
4. DVT
5. Ocular hypertension
6. Normal tension glaucoma
7. Optic disc changes in POAG
8. Glaucomatous optic atrophy
9.Pupillary block
10.Write about the Phaco mechanisms of PACG
11. Pupillary block
12. Plateau iris and Phacomorphic mechanism
13. Primary angle closure suspect
14. Primary angle closure and management
15. Primary angle closure glaucoma
16. Absolute glaucoma
17. Eclipse sign in PACG

UNIT – 5: SECONDRY GLAUCOMA
10 Marks
1. Explain in detail about
▫▫Symptoms & Signs
▫▫Investigation
▫▫Management of Secondary glaucoma
2. Secondary angle closure glaucoma.
3. Explain about the Optic nerve head analysis.
4. Explain in detail about phacolytic and Phacomorphic Glaucoma
5. Write in detail about lens induced glaucoma

6 Marks
1.Secondary Glaucomas – Open & Closed.
2. Pigmentary glaucoma.
3. Malignant Glaucoma.
4. Phacolytic Glaucoma
5. Phacomorphic Glaucoma
6. Lens Induced Glaucoma
7. Glaucoma due to uveitis

8. Neovascular Glaucoma
9. Steroid induced and Traumatic glaucoma
10.Ciliary block glaucoma

3 Marks
1.Malignant Glaucoma.
2. Pseudoexfoliation
3.Pigmentary Glaucoma
4. Axenfieldreger syndrome
5.Evaluation of Glaucoma suspect
6. Optic Nerve Head changes in Glaucoma
7. Absolute glaucoma
8.Management of Absolute Glaucoma
9. Causes of Secondary Glaucoma
10.Give three clinical features of neovascular glaucoma.
11. Intra ocular pressure.
12. Pseudoexfoliation
13.Name the glaucomas associated with Intraocular haemorrhages

UNIT – 6: COMMON MANAGEMENT
10 Marks
1. Explain about Medical Treatment, Laser treatment and Surgical Treatments
2. Classification, mechanism of action and side effects of antiglaucoma medications.

6 Marks
1.YAG PI
2. Classification of Anti glaucoma drugs
3. Surgical management of Glaucoma.
4. Neovascular glaucoma
5. Beta blockers in glaucoma
6. Trabeculectomy
7. Pupillary Block

3 Marks
1. Timolol maleate.
2.Recent advances in Glaucoma
3. History taking in glaucoma (POAG & PNAG).
4. Ocular hypertension
5. Pilocarpine
6. Acetazolamide
7. Yag peripheral iridotomy
8. Goniotomy.
9. Central corneal thickness (CCT).
10.Name two oral medications and their dosage for glaucoma
11. Name three surgeries done for glaucoma.

PAPER 11 – LOW VISION AIDS

IDENTIFYING LVA PATIENT

10 Marks

1. Enumerate common disorders leading to low vision. Write in detail about problems and management of the following:-
A. Corneal Opacity.
B. Glaucoma.
C. Age related macular degeneration.
2. Case study – Assessment and management of a 10 year old school going child with optic atrophy.
3. Enumerate common disorders leading to low vision and write in detail on problems and management in Albinism, Optic atrophy and glaucoma.
4. Write in details about problems and management of the following conditions.
(a) Keratoconus (b) Open angle Glaucoma
(c) Age related Macular degeneration (d) Diabetic Retinopathy
5. Explain about the Low vision assessment techniques
6. Explain about the evaluation of low vision in patient with
A. Cataract
B. Alninism
C. Nystagmus
D. RP

6 Marks

1.Case study – Assessment and management of a 75 year oldretired professor with ARMD.
2. Evaluation of low vision in Cataract,Alninism and Nystagmus
3.Write in detail about problems and management of the following:-
a. Corneal Opacity.
b. Glaucoma.
c. Age related macular degeneration.
4. Explain about the history collection in Low vision
5. Evaluation of low vision in Myopic degeneration
6.Evaluation of low vision inDislocated lens
7. Evaluation of in Retinitis Pigmentosa
8. Optic atrophy evaluation

3 Marks

1. Define visual impairment.
2. Define low vision.
3. Explain the categories of low vision.
4. List the common causes of low vision.
5. Define contrast sensitivity.
6. Enumerate visual functions.
7. List the perceptual skills.
8. Define functional vision.
9. Explain CBR.
10. Working definition of low vision.
11. Legal blindness.
12. Vision Rehabilitation.
13. 13.Contrast Sensitivity.
14. Explain Cardiff acuity chart.
15. Refraction.
16. Travel Vision.
17. History taking in low vision.

18. Glare control.
19. List ocular disorders leading to loss of peripheral field.
20. Blindness
21. Define functional vision, totally blind and visual impairment
22. Contrast sensitivity
23. 24.Define disorder, impairment and disability
24. 25.Log MAR charts.
25. 26. List ocular disorders leading to overall blurred vision.
26. 27. What is glaucoma?
27. Define low vision.
28. Differentiate disorder and impairment.

DIAGNOSTIC PROCEDURE
10 marks
1.Write in diagnostic procedure of the following conditions.
(a) Keratoconus (b) Open angle Glaucoma
(c) Age related Macular degeneration
2. Write in detail procedure in diagnosis of the following:-
a. Corneal Opacity.
b. Glaucoma.
c. Age related macular degeneration.
3. Case study – Assessment and management of a 10 year old school going child with optic atrophy.
4. Enumerate common disorders leading to low vision and write in detail on problems, diagnosis and management in Albinism, Optic atrophy and glaucoma.

6 Marks
1.Field loss in low vision.
2. Categories of visual impairment
3. Write about refraction procedure in low vision patients.
4. Define low vision. Write about WHO classification of low vision.
5. Define Glare. Write about types of glare in low vision.
6.Write in detail about problems and management of the following:-
▫▫Corneal Opacity.
▫▫Glaucoma.
▫▫Age related macular degeneration.
7. Explain about the history collection in Low vision
8. Evaluation of low vision in Myopic degeneration
9.Evaluation of low vision inDislocated lens
10. Evaluation of in Retinitis Pigmentosa
11. Optic atrophy evaluation

3 Marks
1. Blindness.
2. Log MAR Charts.
3.Define Albinism.
4. List the tests in low vision examination.
5. Visual impairment.
6. List the visual acuity charts in low vision.
7. Types of amsler grid chart.
8. List the common disorders of low vision
9. Name the disorders leading to central vision loss in low vision
10. Field loss causes in low vision
11. Visual problems faced in ARMD and Albinism
12. Write in detail about problems and management of the following:-
▫▫Corneal Opacity.
▫▫Glaucoma.

▫▫Age related macular degeneration.
13. Explain about the history collection in Low vision
14.Evaluation of low vision in Myopic degeneration
15.Evaluation of low vision inDislocated lens
16.Evaluation of in Retinitis Pigmentosa
17. Optic atrophy evaluation

OPTICS OF LVA
10 Marks
1. Enumerate the optics, uses, advantages and disadvantages of optical devices.
2. Elaborate the guidelines to determining, magnification and selecting low vision aids for distance and near.
3. Telescopes.
4. Optical devices.
5. Define and types of Magnification; Write briefly on stand magnifiers.
6. Describe optical low vision aids, various types and its basic principles

6 Marks
1. Types of magnifications with examples.
2. Illumination
3. Telescope
4. Magnifing spectacles
5. Magnifiers
6. Electro optical devices.
7. Bioptic telescope.
8. Write about high- plus addition lens in low vision patients.
9. What is Retinitis pigmentosa? How will you manage patients with Retinitispigmentosa?
10. Write about magnification consideration in low vision.
11.Write about hand and stand magnifier.
12. Write about Bi-Optics Telescope.
13. How will you do Refraction in low Vision patients?
14. Write about Relative and Angular Magnification.
15. Define power and magnification. Convert the following value from power to magnification.
a) +20 D = --- Magnification.
b) +22 D = --- Magnification.
16.Write about High plus addition lenses in low vision.

3 Marks
1. Define magnification and list the different types of magnification
2. History taking in low vision
3. Magnification for near
4. Devices for field enhancement
5. Magnification for distance.
6. List ocular disorders leading to central or para central field loss.
7. Writing guide.
8. Magnification for near.
9. Typoscopes.
10. Reading Stand.
11. Large print.
12. Pinhole spectacles.
13. Glare.
14. Define magnification.
15. Advantages and disadvantages of stand magnifier.
16. Principle of Magnifiers
17. Magnifiers types and uses

TEACHING & TRAINING

10 Marks

1.What is multidisciplinary team approach in low vision? List the team Members and explain their roles in low vision intervention.
2.Explain visual skills.
3. Electro optical devices.
4. Non optical devices.

6 Marks

1.Explain multidisciplinary team approach.
2. Explain about the Members of the Low vision team
3. CCTV.
4. Explain elements of vision.
5.Speech synthesizer and talking books
6.Counseling in low vision
7. Environmental modification in low vision.

3 Marks

1. What is the formula for changing the distance from the object to lens?
2. What is the formula for changing the distance from eye and lens?
3. Definition of low vision.
4. Mention about auditory aids.
5. What is fibre tipped pens?
6. Mention about cooking devices for low vision patients.
7. Indication for low vision.
8. What is angular magnification?
9. Fibre-Tipped pens.
10. Pin hole test.
11. Typoscopes.
12. CCTV
13. Speech synthesizer
14. Importance and need of counselling

SELECTION OF LVA

10 Marks

1. Write about the selection of LVA in the following conditions:
a. Corneal Opacity.
b. Glaucoma.
c. Age related macular degeneration.
d. Albinism
e. Coloboma
1. Selection of low vision in
2. Myopic degeneration
3. Evaluation of low vision in dislocated lens
4. Evaluation of in Retinitis Pigmentosa
5. Optic atrophy evaluation

6 Marks

1.Visual acuity assessment and identification of low vision lenses in
Coloboma.
Myopic degeneration.
Retinitis pigmentosa.
2.Write about the selection of LVA in the following conditions:
a. Corneal Opacity.
b. Glaucoma.
c. Age related macular degeneration.
d. Albinism

e. Coloboma
3. Selection of low vision in Myopic degeneration
4. Evaluation of low vision in dislocated lens
5. Evaluation of in Retinitis Pigmentosa
6. Optic atrophy evaluation
7. Vision charts in low vision

10 Marks
1. Define visual field.
2. Define visual Rehabilitation.
3. What is age Related macular degeneration?
4. Notex.
5. Brailey.
6. Write about the selection of LVA in the following conditions:
▫▫Corneal Opacity.
▫▫Glaucoma.
7. Age related macular degeneration.
8. Albinism
9. Coloboma
10. Selection of low vision in
11. Myopic degeneration
12. Evaluation of low vision in dislocated lens
13. Evaluation of in Retinitis Pigmentosa
14. Optic atrophy evaluation

SPECTACLE MOUNTED TELESCOPE & MICROSCOPE
10 Marks
1. Write about the principle and uses of spectacle mounted telescope

6 Marks
1. Optics of spectacle mounted Telescopes
2. Advantages and disadvantages ofspectacle mounted telescope
3. Explain about the uses of spectacle mounted telescope in low vision disorders

3 Marks
1. Principleof Spectacle mounted telescope
2. Advantages of spectacle mounted telescope
3. Disadvantages of spectacle mounted telescope

CHILDREN WITH LOW VISION
10 Marks
1. Explain about the evaluation methods of a low vision child
2. Write in detail about the types of low vision in children
3. Write about the milestones of visual development in children

6 Marks
1.Differentiate methods of testing for young children with low vision.
2. Explain the stages of visual development.
3. A 6 year old child with RP, visual acuity less than 6/36 in both eyes, field less than five degrees now plan the low vision intervention.
6. List the visual skill areas.
7. Explain the importance of CBR in low vision care.
8.Case Study – Assessment and management of a 10 year old child with optic atrophy studying in third standard

3 Marks
1. Visual acuity testing in children
2. Cardiff acuity chart
3. Lea's symbol charts
4. Vision charts for children in low vision
5. VER
6. Catford drum test

BIOPTIC TELESCOPE
10 Marks
1. Explain about the optics,uses and disadvantages of a bioptic telescope

6 Marks
1.Bioptic telescope
2.Contrast Sensitivity
3. Glare control.
4. Projection magnifier.
5. Optics of Bioptic telescope

3 Marks
1. Differentiate keplerian and Galilean Telescope.
2. Principle of Telescopes
3. Advantages and Disadvantages of Telescope.

CONTACT LENS COMBINED SYSTEM
10 Marks
1. Write in detail about the contact lens combined system in low vision

6 Marks
1. Contact Lens combined system in magnification
2. Computer software in low vision

REHABILITATION OF THE VISUALLY HANDICAPPED
10 Marks
1. Explain low vision rehabilitation
2. Management of low vision.
3. Vision Rehabilitation

6 Marks
1. Define rehabilitation and enumerate steps in rehabilitation
2. Strategies for effective low vision strategies
3. Impact of low vision on society and individual
4. Need for rehabilitation services
5. Definition and Concept of Rehabilitation

3 Marks
1. Counseling.
2. Define Rehabilitation.
3. Orientation and mobility
4. Steps of Rehabilitation
5. Vision Rehabilitation

VERIFICATION OF OPTICS
10 Marks
1.Defects occur during manufacturing process.

2. Problems encountered while dispensing spectacles.
3. Boxing system.
4. Write about the verification process of spectacles

6 Marks
1. Errors in power of lens
2. Surface faults in lenses
3. Defects in manufacturing process
4. Write about the process of spectacle verification

3 Marks
1. Errorinpoweroflenses
2. Surfacefaults
3. Transpose-7.50ds/+3.50dcx110in to other cyl and give its spherical equivalent.
4. Name surface faults
5. Bubbles
6. Feathers
7. Manufacturing defects
8. Veins
9. Polishing burns
10. Generator marks
11. Waves
12. Orange peel defects.
13. Errors in power of lens

CENTERING, MARKING & MOUNTING
10 Marks
1. Describe the mounting of lenses
2. Explain about the centring,marking and mounting of lenses
6 Marks
1. Optic center marking
2. Mounting of lenses
3. Surfacing steps
4. Boxing system
5. Glazing

3 Marks
1. Optical center marking
2. DBL and A size
3. Surfacing steps
4. Glazing
5. Types of glazing
6. Blocking
7. Smoothing
8. Polishing
9. Laying off
10. Types of edge forms
11. Rimless fitting
12. Types of one piece lenses

OPTICAL MANUFACTURING
10 Marks
1. Tinted lenses.
2. Materials used in making spectacles
3. Write in details about spectacle lens manufacturing.
4.Explain different types of ophthalmic filters and tints.

5. Elaborate on lens materials such as polycarbonate,trivex,CR-39 and high index lenses.

5 Marks

1. Polarizing lenses.
2. Advantages of high index lenses
3.Ophthalmic filters
4. Aspheric lenses
5. Photo chromatic lenses
6. High index lenses
7. Bifocals
8.Ghost images
9. Types of glass materials
10. Bifocal types based on segments shape.
11. Write about the forms of lenses
12. Trifocals
13. Glass vs plastic materials
14. Lenticular lenses

3 Marks

1. Temple construction
2. Saddle bridge
3.keyhole bridge
4. Draw the parts of frames
5. Types of end piece
6. Types of frame materials
7. Fused bifocals
8. Franklin bifocals
9. ARC
10. Stages of mounting lens
11. Refractive index
12. Trivex
13. Uses of lenticular lenses
14.Bridge area of spectacle frame
15.Specific gravity
16.Tinted lenses
17.uses of pinktint
18.Uses of yellow tint
19. Types of photo chromatic lenses
20. Contrast enhancing filters
21. Segment height
22. Segment drop
23. Equal tint and gradual tint

FITTING OF PROGRESSIVE ADDITION LENSES

10 Marks

1. Refined Refraction
▫▫IPD (Monocular & Binocular)
▫▫Frame Type
▫▫Pantoscopic Tilt
2. Fitting of progressive lenses
3. Explain on different type of progressive designs

6 Marks

1. Advantages and disadvantages of progressive lenses
2.Write about optics of PAL's.
3. Write the types of progressive designs

4. Differentiate between soft and hard designs
5. Write about the trouble shooting of progressive lenses
6.Explain about the PAL fitting
7. Symmetricalandasymmetricalprogressivedesigns.
8.What are the various measurements required to fit a progressive lens?

3 Marks

1.Indications for progressive lenses
2. Disadvantages of PAL
3. Fitting stages of PAL
4. Types of PAL designs
5. Jump effect
6. Differentiate between soft and hard designs
7. Face form wrap
8. Footing height
9. Frame selection in PAL
10. Instructions of PAL users

ANSI STANDARDS

10 Marks

1. Write in detail about ANSI standards

6 Marks

1. Write short notes on ANSI standards
2. Write about the various types of pliers
3. Air blower
4. Pliers

3 Marks

1. Pliers and uses
2. Air blower
3. ANSI standards

PUPILOMETER

10 Marks

1.IPD measurement.
2.Pupillometer
3. Distometer

6 Marks

1. Pupillometer
2. Steps for marking IPD in progressive lenses.
3. Write the advantages and disadvantages of Pupillometer
4. Measurementof IPD by PD ruler

3 Marks

1. Distometer
2. Advantages of PD ruler
3. Types of IPD measurement
4. Pupillometer disadvantages
5. Pd ruler
6. Near PD
7. Distance PD
8. Monocular PD
9. Limbus to limbus method of PD measurements
10. Disadvantages of PD ruler

LENSOMETER

10 Marks

1. Explain about the optics, principle and uses of lensometer
2. Explain about the types, advantages and disadvantages of lensometers

6 Marks

1. Write optics and uses of manual lensometers
2. Explain about automatic lensometers uses and disadvantages
3. Terminologies of lensometers
4. Determination of lens power in lensometers
5. Tests for accuracy in lensometers

3 Marks

1. Optics of standard lensometer
2. Diopter
3. Instrument designs in lensometers
4. Advantages of automatic lensometers
5. Disadvantages of standard lensometer

ABBES VALUE&PANTOSCOPIC TILT

10 Marks

1.Explain about the abbes value in lens materials
2. Write about the pantoscopic tilt and vertex distance for progressive lenses

6 marks

1.Abbe'svalue
2.Pantoscopictilt
3. Define Abbe value.Write about significance of abbe value.

3 Marks

1. Pantoscopic tilt
2. Abbe value
3. Vertex distance
4. Optical density
5. Specific gravity
6. Significance of Abbe value in lens materials

PATIENT SELECTION & SELECTION OF DESIGNS

10 Marks

1. Explain about the patient selection and selection of frames designs according to the facial types of patients

6 Marks

1. Selections of frames for high plus lenses.
2. Write about the different types of facial types for frames selection
3. Lenses used for high plus prescriptions.
4. Selections of frame sand lens for high minus powers.
5. Vertex distance and its effects.
6. Points regarding facial types
7. Types of frame materials
8. Frame colour and hair color
9. Significance of angles in fitting
10. Frames fitting considerations
11. Frames selection for all purposes
12. Selections of frames in PAL user
13. Frame selection in high minus lenses
14. Frames selection in high plus lenses

15. Frames Selections in children
16. Selecting frames in older wearer

3 Marks
1. Frontal angle
2. Splay angle
3. Crest angle
4. Frame colour and hair color
5. Adjustable pads uses
6. Selecting frames for safety wearer
7. Types of frames to be avoided for children
8. Frames selection in older wearer
9. Points regarding facial types
10.List the seven basic facial types

RECENT OPTICAL DEVELOPMENTS
10 Marks
1. Write in detail about the recent optical developments in optometry

SPECIAL PURPOSE FRAMES
10 Marks
1. Framesforspecialpurposes
2.Write in detail about the frames of
o Non-Reactive Materials
o Light Weight
o Flexible Frames

6 Marks
1. Sports spectacles
2. Safety wear spectacles
3. Ptosis and recumbent spectacles
4. Special purpose frames
5. Recumbentspectacles
7.Sideshields

3 Marks
1. Clipons
2. Hemianopic spectacles
3. Entropion spectacles
4. Lorgnette
5. Trigeminal spectacles
6. Reversible spectacles
7. Sports spectacles types
8. Ski goggles
9.Safety goggles
10.Golf spectacles.

PAPER 12- LAW, PRDIATRIC, GERIATRIC & OCCUPATIONAL OPTOMETRY

UNIT – 1: PEDIATRIC OPTOMETRY

10 Mark

1. Add a note on their treatment.
2. What is binoculars inglevision? What is the physiology of binocular single vision?
3. Add a note on the abnormalities of binoculars inglevision.
4. Examination & Diagnosis of amblyopia
5. Pathalogy & Structural Anomalies in congenital cataract
6. 5.Anterior Segments & Posterior Segments Assessment in children
7. 6.Congenital EOM anamolies
8. Write in detail about the retinoblastoma
9. Write in detail about the congenital glaucoma
10. Write in detail about retinopathy of prematurity
11. Write in detail about RP
12. How do you evaluate a case of Esotropia? What are the types of esotropia?

6 Marks

1. Congenital cataract
2. Congenital Dacryocystitis
3. Coloboma
4. Congenital glaucoma
5. Lagophthalmos
6. Ptosis
7. Retinoblastoma
8. Keratoconus
9. Vision charts for children
10. Spectacle dispensing in children
11. Leucocoria and causes

3 Marks

1. Congenital ptosis
2. Blue dot cataract
3. Sutural cataract
4. Complicated cataract
5. Coronary cataract
6. Lamellar cataract
7. Coloboma
8. Types of retinoblastoma
9. Leucocoria
10. Ectopia lentils
11. Symblepheron
12. Congenital anomalies of lens
13. Buophthalmos
14. Trichiasis
15. Occlusion therapy
16. Megalocornea
17. Microphthalmos
18. Enophthalmos
19. Nystagmus
20. Crowding phenomenon
21. Albinism
22. Night blindness

UNIT – 2: GERIATRIC OPTOMETRY

10 MARKS

1. Structuraland physiological Changes of lens
2. Write in detail about the ARMD
3. Writeindetailaboutthe Diabetic retinopathy
4. WriteindetailabouttheHypertensive retinopathy
5. Write in detail about acquired cataract
6. Write in detail about the concamitant squint
7. Write in detail about the vascular disorders of retina
8. Write in. Detail about the CME and CSR
9. Explain about optic neuritis, papilledema
10. Explain AION and optic atrophy
11. Explain in detail about the definition and classification of glaucoma
12. Write about the aging changes in retina
13. Vitreous hemorrhages
14. Vitreous opacities
15. Proptosis
16. Thyroid ophthalmopathy
17. Gonioscopy

6 Marks

1. Acquired cataract
2. Proptosis
3. Graves Ophthalmopathy
4. Vitreous opacities
5. ARMD
6. Diabetic retinopathy
7. Hypertensive retinopathy
8. CSR
9.CME
10. Optic atrophy
11. Adult Dacryocystitis
12. Strabismus classification
13. Secondary glaucoma
14. POAG
15. Aging changes in cornea
16. Aging changes in retina
17. Ectropion
18. Entropion

3 marks

1. Ocular signs of grave's disease
2. Phacolytic glaucoma
3. Arcus senilis
4. Cup disc ratio
5. FFA
6. Confrontation test
7. Orthokeratalgia
8. After cataract
9. Synchisis syntillans
10. Asteroid hyalosis
11. Amsler grid
12. Subluxation of lens
13. Lagophthalmos
14. Entropion
15. Senile ectropion

UNIT – 3: OCCUPATIONAL OPTOMETRY
10 MARKS
1. Explain the Introduction to Occupational Health Hygiene & environment
2. Acts & Rules in occupational optometry
3. Role of optometrists
4. Write in detail about the occupational safety
5. Write in detail about the ocular and visual problems
6. Explain about the visual examination standards for various jobs

6 Marks
1. Occupational optometry
2. Acts & Rules in occupational optometry
3. Role of optometrists
4. Causes of accidents.
5. Give the various indications of lasers in ophthalmology, their hazard and the steps taken for their prevention.
6. Expand LASER. Uses of laser in ophthalmology.
7. Mechanical injuries of eye.
8. Electromagnetic radiations
9. Ionizing and ultra violet radiations
10. Visual examination for drivers,pilots,army and police
11. Vision, lighting color and their role
12. Accident analysis
13. Accident prevention

3 Marks
1. Occupational hygiene
2. Indications for protective glasses
3. Effect of radiations of eye
4. Thermal trauma to eye
5. Visual standards for police
6. Vision,lighting color and their role
7.Accident analysis
8.Accident prevention
9. UV radiations

UNIT – 6: PREVENTIONAL OF OCCUPATIONAL DISEASES
10 Marks
1. Write about the occupational diseases prevention
2. Preventive equipments in occupational diseases
3. Occupational hygiene and environmental monitoring
4. Occupational related diseases caused by physical agents,chemical agents and biological agents
5. Personal protective equipments

6 Marks
1. Personal protective equipments
2. Medical examination and pre employment screening
3. Occupation alhygiene and environmental monitoring
4.Occupational related diseases caused by physical agents, chemical agents and biological agents
5.Personal protective equipments
6.Medical examination and preemployment screening

3 marks
1. Side shields
2. Goggles
3. Personal protective care
4. Medical monitoring
5. Occupational hygiene
6. Environmental monitoring
7. Diseases caused by biological and physical agents
8. Side shields
9. Goggles
10.Personal protective care
11. Medical monitoring

UNIT – 5: LAW & OPTOMETRY
10 Marks
1. License
2. International optometry
3. Malpractice-court
4. Insurance
5. Law Governing optometry
6. Present Rules & Regulation in India
7. Write the procedure initiated by MCI/State Medical Council against
8. Professional misconduct for punishing a physician
9. Computer vision syndrome
10. What are the advantages and disadvantages of ethical code?
11. Enumerate the important points regarding medical negligence and its remedies.
12. Explain on the unethical practices and misconduct of medical and paramedical professionals.
13. Enumerate about medical negligence and its remedies.

6 Marks
1. Insurance
2. Law Governing Present Rules & Regulation inIndia
3. Write the procedure initiated by MCI/State Medical Council against Professional misconduct for punishing a physician
4. ESI act
5. Legal environment and techniques
6. History and theory of licensure
7. Optometrist in court
8. Ethics and professional ethics
9. Present rules and regulations for optical product manufacturer
10. Workmen's compensation act & Factories act

3 Marks
1.License
2.International optometry
3.Malpractice-court
4.Insurance
5.Law Governing optometry
6.Present Rules & RegulationinIndia
7. ESI act&Factories act
9. Negligence
10. Ethics & Professional ethics
12. Malpractice
13. Licensure
14.Laws governing medical profession
15. Legal environment.