# Academic Regulations and Syllabus of 1st Year Graduate Medical Education Program

# Bachelor of Medicine and Bachelor of Surgery (MBBS)

## R23 Regulations

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# Academic Regulations for Bachelor of Medicine and Bachelor of Surgery (MBBS) Program

**(With effect from the Academic Year 2023-24)**

## 1. Title and Duration of the Program

1.1 Undergraduate Medical Education Program - Bachelor of Medicine and Bachelor of Surgery (MBBS).

1.2 The program and distribution of subjects in each Professional Phase is as given in the below table 1:

| Phase & year of MBBS training | Subjects and Teaching Elements | Duration (months) | University examination |
|---|---|---|---|
| First Professional MBBS | i. Foundation Course (1 week), remaining spread over 6 months<br>ii. Anatomy, Physiology & Biochemistry, introduction to Community Medicine including family adoption program (FAP) through village outreach<br>iii. Early Clinical Exposure<br>iv. Attitude, Ethics, and Communication Module (AETCOM) including Humanities | 12 months | 1st professional |
| Second Professional MBBS | i. Pathology, Microbiology, Pharmacology<br>ii. Introduction to Clinical subject<br>iii. Clinical postings, Family visits for FAP<br>iv. AETCOM | 12 months | 2nd professional |
| Third Professional Part I, MBBS including Electives 1 month | i. Community medicine, Forensic medicine, and Toxicology, Medicine and allied, Surgery and allied, | 12 months | Final professional Part-I |

| | | | |
|---|---|---|---|
| | Pediatrics, Obstetrics & Gynecology<br>ii. Family visits for FAP<br>iii. Clinical postings<br>iv. AETCOM<br>v. Electives - 1 month, 2 blocks, 15 days each | | |
| Third Professional Part II, MBBS | i. General Medicine, Dermatology, Psychiatry, Respiratory medicine, Pediatrics, General Surgery, Orthopedics, Otorhinolaryngology, Ophthalmology, Radiodiagnosis, Anesthesiology, Obstetrics & Gynecology<br>ii. Clinical postings<br>iii. AETCOM | 18 months | Final professional Part-II |

1.3 Students admitted to the MBBS program shall have to complete the program within a maximum time frame of 10 years from the year of admission and students shall have to complete the first professional MBBS within a maximum time frame of four years from the year of admission.

## 2. Admission Procedure

2.1 A candidate for admission into the MBBS program must have passed 10+2 level examination or its equivalent with Physics, Chemistry, Biology (Botany, Zoology)/Biotechnology and English or any other examination recognized by the Anurag University as equivalent thereto.

2.2 All the eligible applicants satisfying 2.1 shall be governed by the following admission policy:

a. No student shall be eligible to pursue graduate medical education either in India or elsewhere, except by scoring the minimum eligible score at the NEET-UG

examination. Provided the Under Graduate Medical Education Board shall by notification announce the list of eligible students.

b. Common counselling - without prejudice to anything stated in the present Regulations or other NMC Regulations, there shall be common counselling for admission to graduate courses in medicine for all medical institutions in India based on the merit list of the NEET-UG.

c. Conduct of common counselling - the Under Graduate Medical Education Board shall publish guidelines for the conduct of common counselling, and the designated authority shall conduct the common counselling in conformity with such published guidelines.

d. Government to appoint a designated authority for common counselling - The Central Government or its designated authority shall be the counselling agency for all India quota seats of the contributing States, and the counselling for all admission to graduate courses in medicine in all medical educational institutions in the State / Union territory shall be the concerned State Government or the Administration of the Union territory or their respective designated authority as the case may be.

2.3 Reservation policy as per 4th statutes and ordinances of Anurag University:

a. For MBBS program out of 150 seats, 85% (128) seats shall be reserved for general category with a tuition fee of Rs. 15.00 lakhs and 15% (22) seats shall be reserved for NRI category/in lieu of NRI with a tuition fee of Rs. 22.50 lakhs per annum.

b. Domicile reserved seats shall be provided as per the G.O.Ms.No. 26, Higher Education (UE) Department, Dated 20.08.2019 of Govt. of Telangana.

## 3. Program of Study and Code

| Program | Code |
|---|---|
| Bachelor of Medicine and Bachelor of Surgery (MBBS) | 23 |

## 4. Program Structure & Credits

The program structure is in-line with the guidelines as suggested by NMC. The course-wise classification and break-up of credits are given below.

The following is the credit allocation table.

**Distribution of Subject wise Teaching Hours for M.B.B.S PROFESSIONAL PHASE – I:**

| Subject | Lectures | SGL | SDL | Total |
|---|---|---|---|---|
| Foundation Course | | | | 39 |
| Anatomy | 210 | 400 | 10 | 620 |
| Physiology | 130 | 300 | 10 | 440 |
| Biochemistry* | 78 | 144 | 10 | 232 |
| Early Clinical Exposure** | 27 | | 0 | 27 |
| Community Medicine | 20 | 20 | | 40 |
| FAP | | | 27 | 27 |
| (AETCOM)*** | - | 26 | | 26 |
| Sports and extra-curricular activities | - | - | - | 10 |
| Formative assessment and term examinations | - | - | - | 60 |
| Total | 465 | 890 | 57 | 1521# |

* including Molecular Biology

** Early clinical exposure hours to be divided equally in all three subjects.

*** AETCOM module shall be longitudinal programme.

# Including hours for foundation courses also.

## Distribution of Subject Wise Teaching Hours for M.B.B.S PROFESSIONAL PHASE - III

| Subject | Lectures | SGL | Clinical postings | SDL | Total |
|---|---|---|---|---|---|
| Pathology | 80 | 165 | | 10 | 255 |
| Pharmacology | 80 | 165 | | 10 | 255 |
| Microbiology | 70 | 135 | | 10 | 215 |
| Community Medicine | 15 | 0 | 0 | 10 | 25 |
| FAP | 0 | 0 | 30 | | 30 |
| Forensic Medicine and Toxicology | 12 | 22 | | 8 | 42 |
| Clinical Subjects | 59 | | 540 | | 599 |
| (AETCOM)*** | | 29 | | 8 | 37 |
| Sports, Yoga and extra-curricular activities | | | | 20 | 35 |
| Pandemic module | - | - | | 28 | 28 |
| Final Total | 316 | 516 | 570 | 104 | 1521 |

- Please note, clinical postings shall be for 3 hours per day, Monday to Friday

There will be 15 hours per week for all clinical postings.

## Distribution of Subject Wise Teaching Hours for MBBS PROFESSIONAL PHASE - III (Part – I):

| Subject | Lectures | SGL | SDL | Total |
|---|---|---|---|---|
| Electives | 0 | 156 | 0 | **156** |
| General Medicine | 30 | 50 | 10 | **90** |
| General Surgery | 30 | 50 | 10 | **90** |
| Obstetrics & Gynaecology | 30 | 50 | 1 | **90** |
| Pediatrics | 25 | 30 | 10 | **65** |
| Orthopedics | 15 | 20 | 10 | **45** |
| Forensic Medicine & Toxicology | 40 | 70 | 20 | **130** |
| Community Medicine | 55 | 70 | 20 | **145** |
| FAP (Visits + log book submissions) | - | 21 | 10 | **31** |
| Otorhinolaryngology (ENT) | 15 | 20 | 10 | **45** |
| Ophthalmology | 15 | 20 | 10 | **45** |
| Clinical Posting | | | 540 | **540** |
| AETCOM | 0 | 19 | 12 | **31** |
| Pandemic module | 18 | 0 | 0 | **18** |
| **Total** | **273** | **546** | **672** | **1521** |

## Distribution of Subject wise Teaching Hours for M.B.B.S PROFESSIONAL PHASE – III (Part – II)

| Subjects | Lectures | SGL | SDL | Total |
|---|---|---|---|---|
| General Medicine | 95 | 155 | 55 | **305** |
| General Surgery | 80 | 140 | 40 | **260** |
| Obstetrics and Gynaecology | 80 | 140 | 40 | **260** |
| Pediatrics | 30 | 60 | 30 | **120** |
| Orthopedics | 25 | 35 | 25 | **85** |
| AETCOM | 30 | 0 | 22 | **52** |
| Dermatology | 15 | 10 | 15 | **40** |
| Psychiatry | 15 | 15 | 15 | **45** |
| Otorhinolaryngology (ENT) | 15 | 25 | 15 | **55** |
| Ophthalmology | 15 | 25 | 15 | **55** |
| Radiodiagnosis | 8 | 15 | 15 | **38** |
| Anesthesiology | 8 | 15 | 15 | **38** |
| Pandemic Module | 28 | - | - | **28** |
| **Total** | **444** | **635** | **302** | **1381** |

## Clinical Posting Schedules in weeks:

| Subjects | Period of training in weeks | | | Total Weeks |
|---|---|---|---|---|
| | **II MBBS** | **III MBBS Part 1** | **III MBBS Part II** | |
| Electives | 0 | 4 | 0 | **4** |
| General Medicine | 9 | 4 | 14 | **27** |
| General Surgery | 7 | 4 | 10 | **21** |
| Obstetrics and Gynecology | 7 | 4 | 10 | **21** |
| Pediatrics | 4 | 4 | 5 | **13** |
| Community Medicine | 4 | 4 | 0 | **8** |
| Orthopaedics | 2 | 2 | 4 | **8** |
| Otorhinolaryngology | 0 | 3 | 4 | **7** |
| Ophthalmology | | | | |
| Psychiatry | 0 | 2 | 4 | **6** |
| Radio-diagnosis | 0 | 0 | 2 | **2** |
| Dermatology | 2 | 2 | 2 | **6** |
| Dentistry | 1 | 0 | 0 | **1** |
| Anesthesiology | 0 | 0 | 3 | **3** |
| **Total** | **36** | **33** | **58** | **127** |

**Learner – Doctor programme (Clinical Clerkship)**

| Year of Curriculum | Focus of Learner-Doctor programme |
|---|---|
| Year 1 | Introduction to hospital environment, early clinical exposure, understanding perspectives of illness, family adoption program |
| Year 2 | History taking, physical examination, assessment of change in clinical status, communication and patient education, family adoption program |
| Year 3 | All of the above and choice of investigations, basic procedures and continuity of care |
| Year 4 | All of the above (except Family adoption programme) and decision making, management and outcomes |

## 5. Family Adoption Program - Targets to be achieved by students:

- **First Professional Year**
  a. Learning communication skills and inspire confidence amongst families
  b. Understand the dynamics of rural set-up of that region
  c. Screening programs and education about ongoing government sponsored health related programs
  d. Learn to analyse the data collected from their families
  e. Identify diseases/ ill-health/ malnutrition of allotted families and try to improve the standards
- **Second Professional Year**
  a. Inspire active participation of community through families allotted
  b. Continue active involvement to become the first doctor /reference point of the family by continued active interaction
  c. Start compiling the outcome targets achieved
- **Third Professional Year**

  Analysis of their involvement and impact on existing socio-politico-economic dynamics in addition to improvement in health conditions.

## 6. Assessment pattern

6.1 The performance of a student shall be evaluated course-wise for a maximum of 100 marks in each theory and practical course as per the table given.

6.2 **Formative Assessments:**

**A) Part completion tests / Portion completion tests (PCT's):**

- A total of six PCT's would be conducted during the course.

**Syllabus & Conduction dates:** will be notified from time to time.

**Pattern of Evaluation: Max. Marks: 30 M**

- Essay question – One – 10 marks
- Short questions – Two – 5 marks each
- Very short questions – Two – 3 marks each
- Multiple choice questions – Four – 1 mark each
- Duration: One hour

6.3 **Internal Assessment Examinations:**

A total of Three Internal Assessments would be conducted at the end of completion of each block (Total syllabus is divided in to three blocks).

Internal Assessment I: Only Theory paper

Internal Assessment II: Theory Paper (One paper) and Practical Examination

Internal Assessment III: Theory Paper (Both Paper I & Paper II) and Practical Examination.

**Syllabus:** The syllabus included in the particular block. Conduction time: Will be notified from time to time.

**Pattern of Evaluation (Theory):** Refer to section of Summative assessment below.

**Pattern of Evaluation (Practical's):** Refer to section of Summative assessment below.

6.4 **(a) Calculation of Internal assessment (Theory marks) – for Consolidation:**

- It is a mandate to pass at least two Internal assessments (Obtainment of Minimum of 40% in each).
- An average of best of two Internal assessments would be considered.

(b) **Calculation of Internal assessment (Practical marks) – for Consolidation:**

- Both the assessments should be passed (obtainment of Minimum of 40% in each).
- An average of the two practical assessments would be considered.

6.5 **Criteria to be declared as "PASS" in Internal Assessment examination (Overall):**

a. 50% combined in Theory and Practical (not less than 40% in each).
   and
b. A minimum of 50% of marks in Log book and AETCOM (individually) is required.

6.6 **Eligibility to Qualify for University Examination**

a. There should be a minimum of 75% attendance in theory and 80% in practical / clinical for eligibility to appear for the University examination in that subject.
b. Non adherence to the above strictly leads to disqualification for university examination (even if the Internal assessment marks are good enough).
c. Students who have slided from another institute should produce the attendance certificate (both Theory & Practical) of the previous classes attended immediately after joining the present Institute.
d. Only the Candidates who are declared as PASS in Internal assessment examination (Overall) are eligible to appear University Final examination.

Students who are fulfilling the criteria 6.6a to 6.6d are only eligible to appear for the University examination.

6.7 **Summative Assessment / University Examination:**

Summative assessment shall be conducted at the end of Professional Phase I.

**Pattern of Evaluation (Theory):** Max. Marks - 100 M

- Long Answer Questions / Essay Questions (Structured Essay Question) - TWO (One Clinical based scenario) – 15 M each
- Short Answer Questions (includes Clinical based scenario) – TEN – 5M each
- Multiple-choice Questions – Twenty – 1 Mark each
- Duration: Three hours

| Phase of Course | Theory | Practicals | Passing criteria |
|---|---|---|---|
| 1st MBBS | | | Mandatory to get 40% marks separately in theory and in practical's; and totally 50% for theory plus practical's. |
| Anatomy – 2 papers | Paper 1 – 100 marks | 100 | |
| | Paper 2 – 100 marks | | |
| Physiology – 2 papers | Paper 1 – 100 marks | 100 | |
| | Paper 2 – 100 marks | | |
| Biochemistry – 2 papers | Paper 1 – 100 marks | 100 | |
| | Paper 2 – 100 marks | | |
| 2nd MBBS | | | |
| Pathology – 2 papers | Paper 1 – 100 marks | 100 | |
| | Paper 2 – 100 marks | | |
| Microbiology – 2 papers | Paper 1 – 100 marks | 100 | |
| | Paper 2 – 100 marks | | |
| Pharmacology – 2 papers | Paper 1 – 100 marks | 100 | |
| | Paper 2 – 100 marks | | |
| Final MBBS part I | | | |
| Forensic Medicine & Toxicology – 1 paper | Paper 1 – 100 marks | 50 | |
| Community Med – 2 papers | Paper 1 – 100 marks | 100 | |
| | Paper 2 – 100 marks | | |

## 7. Valuation

a. The answer scripts of the candidate are evaluated by two subject experts independently.

b. If the difference of marks between these two valuations is 15% or more, it will be sent for third valuation to another subject expert.

c. Nearest of two of the three valuations will be considered and the average of these will be taken as the final marks obtained.

d. No Grace marks will be entertained.

### 7.1 Challenge Valuation:

The candidates who are not satisfied with the result, they shall have to apply for challenge valuation by paying the prescribed fee.

a. The paper will be evaluated in the presence of the student by a senior faculty member appointed by the University.

b. If there is any change in the marks $\geq$ 15% of the maximum marks, the new marks will be awarded to the student. Otherwise, there will be no change in original secured marks.

c. If the change in marks ($\geq$ 15% of the maximum marks) and pass the examination, the amount paid towards challenge valuation will be refunded. Otherwise, the student will forfeit the total amount which he/she has paid.

## 8. Award of Class

| Class | Criteria |
|---|---|
| Distinction | $\geq$ 75% aggregate in regular examinations (first attempt) |
| First Class | 65% - 74% aggregate in regular examinations (first attempt) |
| Pass | $\geq$ 50% aggregate |

## 9. Withholding of Results

If the student has not paid the dues, if any, to the University or if any case of disciplinary action is pending against him/her, the result will be withheld, and he/she will not be allowed into the next Phase of learning. In such cases the matter will be referred to the Academic Council for final decision.

## 10. Promotion rules and Supplementary Examinations

10.1 The Candidate who has failed in one or more subjects in the I M.B.B.S Main examination cannot be promoted to next phase of learning unless he / she obtains pass marks in all the subjects.

10.2 There shall be one main examination in an academic year and a supplementary examination will be held not later than 90 days after the declaration of the results of the main examination.

10.3 The Candidate who has earlier failed in the I M.B.B.S Main examination and later passed the subsequent I M.B.B.S supplementary examination can continue the next phase of learning along with his/her peer group. There exists no Referred batch.

10.4 If in case where the candidate has earlier failed in the Main examination and also has failed in the subsequent I M.B.B.S supplementary examination has to appear the next main examination to be held in subsequent academic year.

10.5 A maximum number of four permissible attempts would be available to clear the first Professional University examination, whereby the first Professional course will have to be cleared within 4 years of admission to the said course. If not, the student is not allowed to continue the under graduate medical course. Partial attendance at any University examination shall be counted as an availed attempt.

10.6 Provided under no circumstances the student shall be allowed more than 4 attempts for first year and no student shall be allowed to continue undergraduate medical course after 10 years from the year of admission into the program.

10.7 With regard to the II M.B.B.S Main examination, though a candidate fails in one or more subjects, he / she will be promoted to next phase of learning (Final M.B.B.S Part – I) but unless he / she passes all the back log subjects of II M.B.B.S in the subsequent supplementary examination – they will not be eligible to appear the Main examination of the next phase.

10.8 With respect to Final M.B.B.S Part – I, though the candidate fails in one or more subjects he/ she will be promoted to next phase of learning (Final M.B.B.S Part – II) but unless he / she passes all the back log subjects in the subsequent supplementary examination – they will not be eligible to appear to the Main examination of the next phase.

10.9 Unless the candidate passes the Main examination of Final M.B.B.S Part – II in all the subjects he / she cannot obtain the Provisional course completion certificate.

10.10 Under no circumstances the student can extend his / her study period beyond 10 years from the date of admission. Failure to complete the course within the above maximum stipulated time will be considered as non-conformity and would lead to cancellation of his / her candidature for the award of the degree.

## 11. Internship

The student admitted into a graduate medical programme shall not be deemed to have completed his graduation until he completes his rotating medical internship as per Compulsory Rotating Medical internship (CRMI) Regulations, 2021, subject to amendments made by NMC from time to time.

11.1 Internship is a phase of training wherein a graduate will acquire the skills and competencies for practice of medical and health care under supervision so that he/she can be certified for independent medical practice as an Indian Medical Graduate. In order to make trained work force available, it may be considered as a phase of training wherein the graduate is expected to conduct actual practice under the supervision of a trained doctor. The learning methods and modalities have to be

done during the MBBS course itself with larger number of hands-on session and practice on simulators.

11.2 **Goal**: The goal of the internship programme is to train medical students to fulfill their roles as doctors of first contact in the community.

11.3 **Objectives**: At the end of the internship period, the medical graduate will possess all competencies required of an Indian Medical Graduate, namely:

a. Independently provide preventive, promotive, curative and palliative care with compassion,
b. Function as leader and member of the health care team and health system
c. Communicate effectively with patients, families, colleagues and the community
d. Be certified in diagnostic and therapeutic skills in different disciplines of medicine taught in the undergraduate programme
e. Be a lifelong learner committed to continuous improvement of skills and knowledge
f. Be a professional committed to excellence and is ethical, responsive and accountable to patients, community and profession.

11.4 Every candidate will be required after passing the final MBBS examination to undergo compulsory rotational internship to the satisfaction of the College authorities and University concerned for a period of 12 months so as to be eligible for the award of the degree of Bachelor of Medicine and Bachelor of Surgery (MBBS) and full registration.

11.5 The University shall issue a provisional MBBS pass certificate on passing the final examination.

11.6 The State Medical Council will grant provisional registration to the candidate upon production of the provisional MBBS pass certificate. The provisional registration will be for a period of one year. In the event of the shortage or unsatisfactory work, the period of provisional registration and the compulsory rotating internship shall be suitably extended by the appropriate authorities.

11.7 Further, the student has to complete the internship training within two years from the date of passing the MBBS Professional Phase-III (part -2) examination.

11.8 The core rotations of the internship shall be done in primary and secondary/ tertiary care institutions in India. In case of any difficulties, the matter may be referred to the Medical Council of India to be considered on individual merit.

11.9 The implementation of the training programme is as per the guidelines of NMC from time to time.

11.10 **Time Distribution**:

- Community Medicine (Residential posting) - 2 months
- General Medicine including 15 days of Psychiatry - 2 months
- General Surgery including - 15 days
- Anaesthesia - 2 months
- Obstetrics & Gynaecology including Family Welfare Planning - 2 months
- Pediatrics - 1 month
- Orthopaedics including PM & R - 1 month
- Otorhinolaryngology - 15 days
- Ophthalmology - 15 days
- Casualty - 15 days
- Elective posting (1x15 days) - 15 days

**Subjects for Elective posting will be as follows:**

1. Dermatology, Venereology & Leprosy
2. Respiratory Medicine
3. Radio diagnosis
4. Forensic Medicine & Toxicology
5. Blood Bank
6. Psychiatry

11.11 The intern shall be entrusted with clinical responsibilities under direct supervision of a designated supervising physician. They shall not work independently.

11.12 Interns will not issue medical certificate or death certificate or other medico-legal document under their signature.

11.13 In recognition of the importance of hands-on experience, full responsibility for patient care and skill acquisition, the interns would be posted in District Hospital, Taluka Hospital, Community Health Centre and Primary Health Centre, in addition to Teaching Hospital.

11.14 There will be a committee consisting of representatives of the college/University, the State Government and the District administration, who shall regulate the training of interns. The trainee should obtain certificate of satisfactory completion of training from the relevant administrative authorities which will be countersigned by the Principal/Dean of College.

11.15 **Assessment of Internship:**

a. The intern shall maintain a record of work in a log book, which is to be verified and certified by the medical officer under whom he/she works. Apart from scrutiny of the record of work, assessment and evaluation of training will be undertaken by an objective approach using situation tests in knowledge, skills and attitude during and at the end of the training.

b. Based on the record of work and objective assessment at the end of each posting, the Dean/Principal will issue cumulative certificate of satisfactory completion of training at the end of internship, following which the University shall award the MBBS degree or declare him eligible for it.

c. Full registration shall only be given by the State Medical Council/Medical Council of India on the award of the MBBS degree by the University or its declaration that the candidate is eligible for it.

## 12. Eligibility for the Award of MBBS

A student shall be eligible for award of the MBBS degree if he / she fulfill all the following conditions:

12.1 He / she should have successfully completed all the components prescribed in the program of study to which he / she is admitted.

12.2 The student shall have to obtain certificate of satisfactory completion of internship training.

12.3 No disciplinary action is pending against him/her.

## 13. Transcripts

After successful completion of the total program of study, a transcript containing performance of all academic years/semesters will be issued as a final record. Duplicate transcripts will also be issued if required after the payment of requisite fee.

## 14. Convocation

14.1 The University shall conduct convocation ceremony to confer the degree(s).

14.2 The University shall institute Prizes and Awards to meritorious students during convocation.

## 15. Termination from the program

The admission of a student to the program may be terminated in the following circumstances:

15.1 The student fails to satisfy the requirements of the program within the maximum period stipulated for that program.

15.2 The student fails to satisfy the norms of discipline specified by the university from time to time.

## 16. Student migration

No student designated to a medical institution, notwithstanding anything stated in these Regulations, shall seek migration to any other medical institution after the first academic year of admission.

## 17. Amendments

The regulations hereunder are subject to amendments as may be made by Academic Council from time to time. Any or all such amendments will be effective from such date and to such batches of candidates (including those already undergoing the program).

# ANNEXURE – I: Subject Specific Information

## BIOCHEMISTRY (CODE: BI)

## CURRICULUM – M.B.B.S Professional Phase I

**SUBJECT: Biochemistry**

**COURSE DURATION: One Year (including Assessment)**

### I. SYLLABUS – MEDICAL BIOCHEMISTRY (OVER VIEW)

### A. KNOWLEDGE (THEORY) / COGNITIVE DOMAIN

| Sl.no | Competency No. | Topic |
|---|---|---|
| 1 | BI 1.1 | Cell, Cellular organelles, Structure of Cell membrane and Transport across cell membrane |
| 2 | BI 3.1 to 3.10 | Chemistry and Metabolism of Carbohydrates |
| 3 | BI 4.1 to 4.7 | Chemistry and Metabolism of Lipids |
| 4 | BI 5.1 to 5.5<br>BI 9.3 | Chemistry of Amino acids, Proteins and Metabolism of Amino acids |
| 5. | BI 10.3 to 10.5 & BI 9.1 to 9.2 | Plasma Proteins, Immunology & Extra Cellular Matrix |
| 6. | BI 6.2 to 6.4 | Chemistry and Metabolism of Nucleotides |
| 7. | BI 6.11 to 6.12 & BI 5.2 | Haem Metabolism and Hemoglobin Metabolism |
| 8. | BI 6.1 | Intermediary Metabolism |
| 9. | BI 7.1 to 7.4 | Molecular Biology, Techniques & Gene therapy |
| 10. | BI 2.1 to 2.7 | Enzymes |
| 11. | BI 8.1 to 8.5 & BI 11.23 to 11.24<br>BI 6.5 & BI 6.9 to 6.10 | Nutrition including Dietetics<br>Vitamins and<br>Minerals |
| 12. | BI 6.6 | Biological Oxidation |
| 13. | BI 11.17 | Endocrinology including Mechanism of Hormone action |
| 14. | BI 6.7 to 6.8 | Biochemical functions, diseases and organ function tests – Liver, Kidney, Thyroid and Adrenals. |
| 15. | BI 6.13 to 6.15 | Fluid Electrolyte and Acid – Base balance |
| 16. | BI 7.5 to 7.7 | Metabolism of Xenobiotics, Oxidative Stress (Free - radicals) and Anti - Oxidants |
| 17. | BI 10.1 to 10.2 | Biochemistry of Cancer & Tumor markers |
| 18. | BI 11.1 to 11.3, BI 11.6;<br>BI 11.18 to 11.19;<br>BI 11.5; BI 11.15 | Basis for Biochemical tests done in diseases<br>Biochemical laboratory tests and Principles<br>underlying Biochemical techniques |

- **CONDUCTION OF TEACHING SESSIONS**: As per the Time table (Refer to the section of Time table).

- **TEACHING / LEARNING METHODOLOGIES**

DL – Didactic Lecture

SGD – Small Group Discussions

SDL – Self Directed Learning

ECE – Early Clinical Exposure

Student Seminars

## B. PRACTICAL SKILLS / PSYCHOMOTOR DOMAIN (OVERVIEW)

**1. Demonstrations:** Laboratory Safety & Equipment, Sample Collection & Biohazard waste management, Colorimetry/ Spectrophotometry, Automation & QC, pH meter, Electrolyte analyzer, ABG analyzer, ELISA, Serum Protein Electrophoresis, PAGE & Immunodiffusion, Paper & Thin Layer Chromatography and DNA isolation.

**2. Qualitative Analysis (Experiments):** Analysis of Normal, Abnormal Constituents of Urine* and Urinary Screening tests for Inborn errors of Metabolism.

**3. Quantitative Analysis (Experiments):** Estimation of Plasma Glucose*, Serum Urea*, Serum Creatinine*, Serum Total Proteins, Albumin & A/G ratio*. Estimation of, LFT, Lipid profile parameters, Calcium, Phosphorus and CSF analysis.

4. **Clinical Case Studies (Case Based Learning)**

**5. OSPE – SPOTTERS:** Response stations and Procedural stations (Demonstration of SMBG / Urine dipstick analysis – for Glucose & Ketone bodies).

**6. Diet Charts**

(* denotes Certifiable Competencies)

- **RECORD:** A record of Practical work has to be maintained. A completed record has to be submitted before attending the Practical class. If not the student is considered absent to the particular class.

A total of 5M are allotted for the evaluation of the Practical record as a part of Practical examination.

- **LOG BOOK:** According to the new CBME Curriculum a Subject – wise Log book has to be maintained by the student. It consists of the record of activities done by the student inthat particular phase of learning. Log book is evaluated for a total of 20M.

**C. AETCOM (AFFECTIVE DOMAIN):**

**Module 1.1** - Enumerate and Describe the role of a physician in health care system.

- Describe and discuss the commitment to lifelong learning as an important part ofphysician growth.

- Evaluation for AETCOM occurs both in the Theory (as a short answer question for 5M) and also as a part of reflections in Log book.

## I. RECOMMENDED BOOKS

1. Textbook of Biochemistry for Medical students -10 /e – D.M.Vasudevan (Revised reprint), JaypeePublications.
2. Lippincott Illustrated Reviews – Biochemistry – SAE - 7/e Denise R. Ferrier, Wolter KluwersPublications.
3. Textbook of Medical Biochemistry - 5/e - Dr. S.K.Gupta, Arya Publications.
4. Textbook of Biochemistry - 4/e - Rafi M. D Universities Press.
5. Textbook of Medical Biochemistry – 5/e – Dinesh Puri, Elsevier Publications.
6. Text book of Biochemistry with Clinical approach and Case studies for MBBS students by Dr.Poonam Agrawal – CBS publishers & distributors.
7. Textbook of Medical Biochemistry – 8/e – M.N.Chatterjee & Rana shinde, Jaypee publications.

**Reference books:**

1. Harper's Illustrated Biochemistry – 31/e - Rodwell; Bender; Botham; Kennelly, Mac Graw hillpublications.
2. Tietz Textbook of Clinical Chemistry and Molecular Diagnostics - 5/e - Carl A. Burton; Ashwood;Burns, Elsevier publications.
3. Textbook of Biochemistry with Clinical Correlations - 7/e - Thomas M. Devlin, Wiley publications.
4. Clinical Biochemistry - Metabolic and Clinical Aspects - 3/e - Marshall; Lapsley; Day; Ayling,Churchill Livingstone.

## II. EVALUATION / ASSESSMENT

### I. Formative Assessments:

A) **Part completion tests:** A total of Six PCT's would be conducted during the course.

**Syllabus & Conduction dates:** will be notified from time to time.

**Pattern of Evaluation: Marks: 30 M**
Essay question – One – 10 M
Short questions – Two – 5 M each
Very Short questions – Three - 3M each

**Duration:** One hour

B) **Internal Assessment Examination:** A total of Three Internal Assessments would be conducted at the end of completion of each block (Total Syllabus divided in to threeblocks).

**Internal Assessment I:** Only Theory paper

**Internal Assessment II:** Theory Paper (One paper) and Practical Examination **Internal Assessment III:** Theory Paper (Both Paper I & Paper II) and Practical Examination.

**Syllabus:** The syllabus included in the particular block.

**Conduction time:** Will be notified from time to time.
**Pattern of Evaluation (Theory):** Refer to section of Summative assessment below.
**Pattern of Evaluation (Practicals):** Refer to section of Summative assessment below.

**Calculation of Internal assessment (Theory marks) – for Consolidation:**

It is a mandate to pass at least two Internal assessments (Obtainment of Minimumof 40% in each).

An average of best of Two Internal assessments would be considered.

**Calculation of Internal assessment (Practical marks) – for Consolidation:** Both the assessments should be passed (obtainment of Minimum of 40% in each). An average of the two practical assessments would be considered.

**Criteria to be declared as "PASS" in Internal Assessment examination (Overall):**

(a) 50% combined in Theory and Practical (not less than 40% in each).

and

(b) A minimum of 50 % of marks in Log book and AETCOM (individually) is required.

**Eligibility to Qualify for University Examination:** Only the Candidates who are declared as PASS in Internal assessment examination (Overall) are eligible to appear University Final examination.

II. **Summative Assessment:**

Conducted at the end of Professional Phase I

**Theory:** Two Papers – Paper – I: 100 M and Paper – II: 100M

**Syllabus**: Refer to Syllabus – Medical Biochemistry (Overview).

**Paper I –** Sl.no 1,2,3,10, 11,12 & 18 (also includes AETCOM)

**Paper II – Sl.no. 4,5,6,7,8,9,13,14,15,16 &17 (also includes AETCOM)**

**Pattern of Evaluation (Theory): Marks: 100M**

- Long Answer Questions / Essay Questions (Structured Essay Question) –
- TWO (One Clinical based scenario) – 15M each
- Short Answer Questions (includes Clinical based scenario) – TEN – 5M each
- Multiple Choice questions – Twenty – 1M each

**Duration:** Three hours

**Pattern of Evaluation (Practical's) - Marks: 100M**

- Qualitative experiment: 20M
- Quantitative Experiment: 20M
- OSPE (Procedural & Response stations): 20M
- Clinical Case studies: 15M (Major Case study –10M, Minor case study – 5 M)
- Theory Viva: 20M
- Record: 5M

**Criteria to be declared as PASS in University examination**

A) Theory Examination: Learner must secure a minimum of 40% of marks in aggregate (both papers together) to pass the subject.

B) Overall Criteria: The learner should obtain 50% marks in aggregate (both Theory & Practical). Eg: 40% Theory (minimum) and 60 % Practical's (or) 60% Theory and 40% (minimum) in Practical's.

# MODEL QUESTION PAPER (PAPER – I)

**NEELIMA INSTITUTE OF MEDICAL SCIENCES (Affiliated to Anurag University)**

**M.B.B.S PROFESSIONAL PHASE – I (2023 – 2024 BATCH)**

**DEPARTMENT OF BIOCHEMISTRY**

**SUMMATIVE ASSESSMENT (PAPER - I)**

Time duration: 3 Hours Max. Marks: 100

Answer all the Questions.

Draw neat labelled diagrams where ever necessary

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**Long Answer Questions:** **2 x 15 = 30M**

**1.** A 6yr old boy was brought to hospital with complaints of Weakness, sweating (signs of Hypo glycemia) which disappeared on eating food. On examination there was grossly enlarged abdomen with Hepatomegaly.

Investigations revealed the following -
Blood glucose - 52 mg/dl,
pH = 7.26,
Serum Lactate level - 40 mg/dl (N= 3 - 8),
Serum Uric acid = 10.6 mg/dl (N = 3 - 7 mg/dl),
Serum Triglycerides = 436 mg/dl (N = < 150)

**Answer the following:**

**a)** What is the probable type of Storage disorder the patient is suffering from?

**b)** Describe the Biochemical basis for the above Clinical and lab findings.

**c)** Tabulate the enzymatic defect, products accumulated and Clinical features of the other storage disorders associated with the above pathway. (2+8+5)

**2.** Tabulate the structural and functional details of various Lipoproteins. Describe in detail the metabolism LDL - C in our body. Add a note on Type I &Type IIa Hyperlipoproteinemia. (6+6+3)

**Short answer Questions:** **10 x 5 = 50M**

**3.** An Industrial worker was on Hunger strike since few days. He suddenly became unresponsive and was rushed to emergency. Laboratory investigations were performed and the data is as follows: Urine ketones – Positive. ABG showed – pH = 7.20, HCO3 –14 mmol/L (N: 21– 28), PCO2- 37 mmHg (N: 35 – 48)

(a) Mention the Acid – Base disorder the above patient is suffering from & Justify your diagnosis based on the given clinical and laboratory data.

(b) Describe the Long-term compensatory mechanism which could occur in his body to restore PH back to normal. (2.5+2.5)

**4.** Illustrate the various components of Electron transport chain. Describe in detail theMitchell's chemiosmotic theory of ATP synthesis. (2+3)

**5.** Explain the Clinical utility of estimation of Enzymes in diagnosis of the followingdiseases / conditions

(a) Myocardial Infarction (b) Acute Hepatitis (3+2)

**6.** Compare and Contrast the important differences between Fatty acid Oxidation andFatty acid synthesis

**7.** Describe how "Glucagon" causes the following effects in our body: (2.5+2.5)

(a) Conversion of Fructose - 1,6 Bisphosphate to Fructose – 6 – Phosphate

(b) Break down of stored fat in our body leading to generation of energy.

**8.** (a) Define HbA1c. Write about its Clinical significance.

(b) Compare and Contrast any three differences between "Glycoproteins" and Proteoglycans" (2+3)

**9.** Justify the following statements:

(a) 'Fats' burn under the wick of 'Carbohydrates'

(b) Aspartate Transaminase (AST) and Creatine Kinase (CK) are Non – specific markersof Myocardial Infarction. (2+3)

**10.** Outline the steps of Prostaglandin synthesis. Write about the role of Prostacyclin andThromboxane in Coagulation / Anticoagulation mechanisms. (2.5+2.5)

**11.** Explain why Diabetic Keto acidosis causes High Anion gap metabolic Acidosis.

Add a note on the role of kidney in compensation of the above condition. (2.5+2.5)

**12.** Outline the various qualities and roles of a Physician required for maintaining a healthy doctor – Patient relationship.

**Multiple Choice Questions (Choose the best Answer): 20 x 1 = 20M**

**13.** "ATP – Citrate Lyase" catalyzes a reaction concerned with which of the following pathways?

(a) Gluconeogenesis (b) HMP shunt pathway

(c) Phospholipid synthesis (d) Fatty acid synthesis

**14.** Which of the following acts as an inhibitor of "Complex IV" of ETC?

(a) Rotenone (b) British Anti lewisite

(c) Cyanide (d) 2,4 DinitroPhenol

**15.** The Anti - Cancer drug – "Methotrexate" acts by which of the following types of Enzyme inhibition mechanism?

(a) Non-Competitive Inhibition (b) Competitive Inhibition

(c) Suicidal Inhibition (d) Uncompetitive Inhibition

**16.** Type IV Collagen is present in which of the following tissues?

(a) Skin (b) Bone (c) Lungs (d) Nephron

**17.** Which of the following is Co – enzyme involved in Transamination reactions?

(a) Thiamine Pyro phosphate (b) Pyridoxal phosphate

(c) Pantothenic acid (d) Biotin

**18.** The sugar component of Cerebrosides is

(a) Galactose (b) Fructose

(c) Ribose (d) Lactose

**19.** Which of the following belongs to Alpha – 2 Globulins?

(a) Albumin (b) Transferrin

(c) Immunoglobulins (d) Haptoglobulin

**20.** Which of the following Glucose transporters are Insulin sensitive?

(a) GLUT -1 (b) GLUT - 2

(c) GLUT – 3 (d) GLUT – 4

**21.** "Respiratory Distress Syndrome" occurs due to deficiency of which of the following Phospholipid?

(a) Phosphatidyl Ethanolamine (b) Phosphatidyl Choline

(c) Phosphatidyl Inositol (d) Phosphatidyl Serine

**22.** "Bilirubin" is detoxified in our body by which of the following conjugating agent?

(a) Glycine (b) Glucuronic acid

(c) Glutathione (d) Acetyl CoA

**23.** Enzyme "Catalase" acts an Anti - Oxidant by neutralizing which of the following free radical?

(a) Superoxide anion (b) Hydrogen peroxide

(c) Hydroxyl radical (d) Hydroperoxyl radical

**24.** Identify the Normal range of "Serum Osmolality" among the following:

(a) 265 – 275 mosm/Kg (b) 255 – 285 mosm/Kg

(c) 225 – 245 mosm/Kg (d) 275 – 295 mosm/Kg

**25.** Activated B cells give rise to which of the following cells?

(a) Antibodies (b) NK cells

(c) Antigen presenting cells (d) Plasma cells

**26.** The "Reproducibility of the test result" is termed as which of the following?

(a) Precision (b) Accuracy

(c) Bias (d) Coefficient of variation

**27.** The "Second messenger" responsible for the action of Thyroid Stimulating Hormone?

(a) cAMP (b) cGMP

(c) IP3/ DAG (d) Intrinsic Tyrosine Kinase activity

**28.** Triacyl glycerols are synthesized in which sub cellular organelle?

(a) Lysosomes (b) Mitochondria

(c) Smooth Endoplasmic reticulum (d) Golgi apparatus

**29.** "Statins" are used as a medication to decrease the blood levels of which of the following?

(a) Glucose (b) Ketone bodies

(c) Uric acid (d) Cholesterol

**30.** Sudden Infant Death Syndrome (Fatty acid Oxidation disorder) is due to the deficiency of which of the following enzymes?

(a) Medium chain Acyl CoA dehydrogenase (b) Cerebrosidase

(c) Galactosidase (d) Lipoprotein lipase

**31.** In which of the following organs does "Ketone bodies" synthesis occur?

(a) Kidney (b) Muscle (c) Liver (d) Brain

**32.** The drug "Aspirin" is detoxified by which of the following type of mechanism?

(a) Oxidation (b) Hydrolysis

(c) Conjugation (d) Reduction

# MODEL QUESTION PAPER (PAPER – II)

**NEELIMA INSTITUTE OF MEDICAL SCIENCES (Affiliated to Anurag University)**

**M.B.B.S PROFESSIONAL PHASE – I (2023 – 2024 BATCH)**

**DEPARTMENT OF BIOCHEMISTRY**

**SUMMATIVE ASSESSMENT (PAPER - II)**

**Time duration: 3 Hours** **Max. Marks: 100**

**Answer all the Questions.**

**Draw neat labelled diagrams where ever necessary**

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**Long Answer Questions:** **2 x 15 = 30M**

**1.** A 5 yr old boy was brought to paediatric OPD with complaints of delayed growth and mental retardation. On examination he had light coloured hair skin and eyes. His mother also complained that his urine had a mousy odour. Investigations revealed the following:

Blood Phenyl alanine level = 45 mg/dl (N = 1mg/dl). T4 = 1.4 $\mu$g/dl (N = 6.0 – 12.0),

Plasma Catecholamine levels – low. Urine Ferric chloride test – Positive.

**Answer the following:**

**1.** What is the probable diagnosis?

a) Mention the metabolic defect leading to this disorder.

b) ) Describe the Biochemical basis for the Clinical and laboratory findings seen in this case

c) What is the dietary advice you suggest to the mother of this child?

d) Enumerate the other metabolic disorders and associated enzymatic defects concerned withthe metabolism of above Aminoacid. (1+1.5+7+1.5+4)

**2.** Answer the following questions on Protein Synthesis (Translation) in Eukaryotes:

(a) Write about the steps of activation of aminoacid

(b) Describe in detail about the steps of Elongation & Termination

(c) Explain the mechanism of Covalent modification of Protein with relevant examples.

(d) Name any four bactericidal drugs which act by inhibition of Protein synthesis. Mentionthe mechanism of Inhibition of any two drugs (2 + 5 + 4 +4)

**Short answer Questions:** **10 x 5 = 50M**

**3.** Tabulate the Inheritance, Enzymatic defect, products accumulated and clinical features of different types of Porphyrias.

**4.** (a) Describe the various steps involved in synthesis of Thyroid hormones.
(b) Interpret the following Thyroid function test report and justify your diagnosis:
T3 - 0.46 ng/ml (N = 0.87 - 1.70),
T4 - 3.70 $\mu$g/dl (N = 6.2 - 12.0) &
TSH - 0.19$\mu$IU/ml (N = 0.3 -5.0) (3+2)

**5.** Explain the steps involved in the formation of "Uric acid" in our body.
Enlist any four causes of Hyperuricemia (4+1)

**6.** Justify the following statements:
(a) Vitamin B6 deficiency leads to Microcytic hypochromic anaemia
(b) Vitamin B12 deficiency leads to Methyl Malonicaciduria (2+3)

**7.** Describe in detail the Mucosal Block Theory of Iron absorption. Add a note on Hemosiderosis. (4+1)

**8.** Compare and Contrast the important differences between Protein Energy Malnutrition disorders (Kwashiorkar & Marasmus).

**9.** Describe the various steps involved in Polymerase Chain Reaction. Mention any four applications of it. (3 + 2)

**10.** Define & Classify Tumor markers. Describe in detail regarding any one tumor marker. (1+2+2)

**11.** Illustrate with a neat labelled diagram – the formation of Urea from Ammonia. Add a note on Hyperammonemia's. (3+2)

**12.** What do you mean by the term Empathy? Describe its importance in maintenance of Good Doctor -Patient relationship.

**Multiple Choice Questions (Choose the best Answer):** **20 x 1 = 20M**

**13.** Which of the following is the Vitamin acts as a Co -enzyme for "Carboxylation"reactions?
(a) Thiamine (b) Pyridoxine
(c) Niacin (d) Biotin

**14.** In a patient with Cushing's disease the levels of Cortisol and ACTH will be

(a) Cortisol increases and ACTH decreases (b) Cortisol decreases and ACTH increases

(c) Cortisol increases and ACTH increases (d) Cortisol decreases and ACTH decreases

**15.** 'Carbon 6' of the Purine ring is donated by which of the following compounds?

(a) Glycine (b) Aspartic acid (c) Folic acid (d) Carbon dioxide

**16.** Which of the following is a purely Ketogenic Aminoacid?

(a) Phenylalanine (b) Valine (c) Glycine (d) Lysine

**17.** Which of the following enzyme is responsible for Immortality of Cancer cells?

(a) Helicase (b) Telomerase (c) RNA Polymerase I (d) DNA Polymerase

**18.** Which of the following conditions cause an elevation in Direct Bilirubin (ConjugatedBilirubin)?

(a) Criggler Najjar syndrome – type I ( b ) Dubin johnson's syndrome

(c) Gilbert's syndrome (d) Physiological jaundice of Newborn

**19.** Northern blotting is a technique used for detection of which of the following?

(a) RNA (b) DNA (c) Proteins (d) Enzymes

**20.** A 10 yr old boy presented with Hemolytic Anaemia. Which of the following plasma protein is decreased in this patient.

(a) Transferrin (b) Ceruloplasmin (c) Haptoglobin (d) Alpha -1 Anti Trypsin

**21.** Which of the following DNA polymerases are concerned with the repair of DNA

(a) DNA Polymerase Alpha (b) DNA Polymerase Beta

(c) DNA Polymerase delta (d) DNA Polymerase Epsilon

**22.** Wilson's disease is due to the mutation in gene encoding

(a) P -type ATP ase (ATP 7B protein) in Liver (b) P -type ATP ase (ATP 7A protein) in Liver

(c) P- type ATP ase (ATP 7A protein) in Intestine (d) P -type ATPase (ATP 7 B protein) in Intestine

**23.** Lead inhibits Heme synthesis by inhibition of which of the following enzymes:

(a) Uroporphyrinogen decarboxylase (b) Protoporphyrinogen Oxidase

(c) Ferrochelatase (d) ALA Synthase

**24.** Which of the following statements concerning dietary fat is correct?

a. Coconut oil is rich in MUFA and Olive oil is rich in Saturated fats
b. Fatty acids containing trans double bonds, unlike the naturally occurring cis isomers, raise high density lipoprotein cholesterol levels.
c. The PUFA linoleic and linolenic acids are required components.
d. TAG obtained from plants generally contain less Unsaturated fatty acids than do those from animals.

**25.** Which of the following enzyme elevation majorly represents an Obstructive liver disease?

(a) Alanine transaminase (b) Gamma Glutamyl transpeptidase

(c) Aspartate transaminase (d) Aldolase

**26.** Which of the following is an Oncogenic RNA virus?

(a) Hepatitis B virus (b) Human Papilloma virus

(c) Human T -cell Leukemia virus (d) Respiratory Syncytial virus

**27.** Blood Urea Nitrogen is calculated by which of the following formula?

(a) Given Blood Urea value / 2.14 (b) Given Blood Urea value / 3.14

(c) Given Blood Urea value / 2.24 (d) Given Blood Urea Value / 3.24

**28.** Which of the following is the Inheritance pattern of Lesch – Nyhan syndrome?

(a) Autosomal dominant (b) Autosomal recessive

(c) X – Linked recessive (d) X -Linked dominant

**29.** Rhodopsin is made up of which of the following:

(a) 11 cis Retinal and Opsin (b) 11 trans Retinal and Opsin

(c) All trans Retinal and Opsin (d) All cis Retinal and Opsin

**30.** Folic acid is absorbed in which of the following sites of GIT?

(a) Jejunum (b) Duodenum (c) Stomach (d) Colon

**31.** Which of the following drug is an inhibitor of Transcription in Prokaryotes?

(a) Adriamycin (b) Fluoroquinolones (c) Streptomycin (d) Rifampicin

**32.** Maple syrup urine disease is associated with defective metabolism of which of the following Amino acids?

(a) Glycine (b) Glutamine (c) Histidine (d) Isoleucine

## ANATOMY (CODE: AN)

## ANATOMY SYLLABUS

Based on competencies

**PAPER - I**

**(A) General Anatomy**
**(B) Upper Limb**
**(C) Head and Neck**
**(D) Neuro Anatomy**
**(E) General Histology**
**(F) General Embryology**
**(G) Medical Genetics**

**PAPER - II**

(A) **Thorax**
**(B) Abdomen and Pelvis**
**(C) Lower Limb**
**(D) Systemic Histology**
**(E) Systemic Embryology**

| Competency Code | Topic | No. Of Competencies |
|---|---|---|
| | **(General Anatomy)** | |
| AN - 1 | Anatomical Terminologies | 02 |
| AN - 2 | General features of Bones and Joints | 06 |
| AN - 3 | General features of Muscle | 03 |
| AN - 4 | General features of Skin and Fascia | 05 |
| AN - 5 | General features of Cardiovascular system | 08 |
| AN - 6 | General features of Lymphatic system | 03 |
| AN - 07 | Introduction to nervous system | 08 |
| | **(Upper Limb)** | |
| AN - 08 | Features of Individual bones | 06 |
| AN - 09 | Pectoral region | 03 |
| AN - 10 | Axilla, shoulder and scapular region | 13 |
| AN - 11 | Arm and cubital fossa | 06 |
| AN - 12 | Fore Arm and Hand | 15 |
| AN - 13 | General features, Joints, Radiographics, Surface markings | 08 |
| | **(Lower Limb)** | |
| AN - 14 | Features of individual bones | 04 |
| AN - 15 | Front and Medial side of thigh | 05 |
| AN - 16 | Gluteal region and back of thigh | 06 |
| AN - 17 | Hip Joint | 03 |
| AN - 18 | Knee Joint, Anterior compartment of leg & Dorsum of foot | 07 |
| AN - 19 | Back of leg and sole | 07 |
| AN - 20 | General features, Joints, Radiographs and surface markings | 10 |

| | | |
|---|---|---|
| AN - 21 | **(Thorax)** Bones, Boundaries, Intercostal Muscles, Nerves, Vessels, Boundaries of Mediastinum. | |
| AN - 22 | Pericardium and Heart | 07 |
| AN - 23 | Mediastinum | 07 |
| AN - 24 | Lungs and Trachea | 06 |
| AN - 25 | Development Heart, Lungs & Aortic arches | 09 |
| | **(Head and Neck)** | |
| AN - 26 | Skull Osteology | 07 |
| AN - 27 | Scalp | 02 |
| AN - 28 | Face and Parotid region | 10 |
| AN - 29 | Posterior Triangle of Neck | 04 |
| AN - 30 | Cranial Cavity | 05 |
| AN - 31 | Orbit | 05 |
| AN - 32 | Anterior Triangle | 02 |
| AN - 33 | Temporal and Infra temporal regions | 05 |
| AN - 34 | Sub mandibular region | 02 |
| AN - 35 | Deep structures in the neck | 10 |
| AN - 36 | Mouth, Pharynx and palate | 05 |
| AN - 37 | Cavity of Nose | 03 |
| AN - 38 | Larynx | 03 |
| AN - 39 | Tongue | 02 |
| AN - 40 | Organs of Hearing & equilibrium | 05 |
| AN - 41 | Eye ball | 03 |
| AN - 42 | Back region | 03 |
| AN - 43 | Back region | 09 |
| | **ABDOMEN & PELVIS** | |
| AN - 44 | Anterior abdominal wall | 07 |
| AN - 45 | Posterior abdominal wall | 03 |
| AN - 46 | Male external genitalia | 05 |
| AN - 47 | Abdominal cavity | 14 |
| AN - 48 | Pelvic wall and viscera | 08 |
| AN - 49 | Perineum | 05 |
| AN - 50 | Vertebral column | 04 |
| AN - 51 | Sectional Anatomy | 02 |
| AN - 52 | Histology and Embryology | 08 |
| AN - 53 | Osteology | 04 |
| AN - 54 | Radio diagnosis | 03 |
| AN - 55 | Surface marking | 02 |
| | **NEURO ANATOMY (BRAIN)** | |
| AN - 56 | Meninges and CSF | 02 |
| AN - 57 | Spinal cord | 05 |
| AN - 58 | Medulla oblongata | 04 |
| AN - 59 | Pons | 03 |
| AN - 60 | Cerebellum | 03 |

| | | |
|---|---|---|
| AN - 61 | Mid brain | 03 |
| AN - 62 | Cranial Nerve Nuclei & Cerebral Hemispheres | 06 |
| AN - 63 | Ventricular system | 02 |

## RECOMMENDED BOOKS FOR MBBS 1st YEAR(ANATOMY)

1. General Anatomy - Vishram Singh / V. Shubhadra Devi / Hand book of General Anatomy by BDC
2. Gross Anatomy - Vishram Singh - All 3 Volumes /
   Moore's clinically oriented Anatomy (Vol. I & II)
   Snell's Clinical Anatomy
   B. D. Chaurasia's
3. Neuro Anatomy - Text book of Clinical Neuro Anatomy, (Vishram Singh)
   Neuro Anatomy for Medical students (G.P. Pal)
4. Histology Text & Atlas Histology by (Brijesh Kumar)
   - Pushpalatha .K. - I. B. Singh's Text book
   - Difiore's Atlas of Histology
5. Embryology LANGMAN'S Medical Embryology/ Vishram Singh
6. Medical Genetics G.P. Pal / S.D. Gangane
7. Dissector Grant's Dissector
   Dissection Manual - (3 Volumes) Mercy NavisPhotographic dissector
8. Atlas Netter's Atlas / Grant's Atlas
9. Dissection Instruments
   - Scalpel and removable blade
   - Forceps - Pointed / Non-toothed / Toothed.
   - Probe
   - Large scissors
   - Small Scissors
   - Hemostat
   - Histology - Heamatoxylin / Eosin pencils
     Histology practical Manual (Balakrishna Shetty)

## EXAMINATION PATTERN FOR 1st YEAR MBBS

### Pattern of University theory question paper

## Anatomy - 2 papers each

**Each paper carries 100 marks.**

1. Essay questions - 2 x 15 = 30 marks
2. Short questions - 10 x 5 = 50 marks
3. MCQs - 20 x 1 = 20 marks

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100 marks

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### Pattern of University practical examination

## 1. Practical - 80 marks

(a) Gross Anatomy - 40 marks
- 10 Spotters 20 marks
- Major Organ discussion 10 marks
- Minor Limb discussion 05 marks
- Surface marking question 05 marks

(b) Histology - 40 marks
- 10 Spotter 20 marks
- Genetic chart question 10 marks
- Slide discussion - I 05 marks
- Slide discussion - II 05 marks

## 2. Viva voce - 20 marks

(a) Osteo-appendicular - 05 Marks
(b) Osteo-axial - 05 marks
(c) Embryology - 05 marks
(d) Radiology - 05 marks

## NEELIMA INSTITUTE OF MEDICAL SCIENCES

## DEPARTMENMT OF ANATOMY

### 1st MBBS EXAMINATION - MODEL PAPER- I

TIME : 3 Hrs. Max. Marks: 100

Note: Answer all questions, illustrate your answers with diagrams wherever necessary.

### LONG ESSAY QUESTIONS 2 X 15 = 30

1. A 45 years old woman yawned widely during watching a TV programme late night to her dismay she could not close her mouth, her jaw was locked. 1+3+2+3+3+3 = 15

(A) Name the joint that is dislocated
(B) Type of this joint and name the bone taking part in it.
(C) What is the peculiarity of the joint cavity
(D) Write Ligaments of the joint and muscles.
(E) Describe Movements produced by the muscles.
(F) Write Clinical Anatomy.

2. Describe Medulla Oblongata under following headings. 5+5+5 = 15

(A) External features
(B) TS of Medulla at the level of sensory decussation.
(C) Medial Medullary Syndrome.

### SHORT ESSAY QUESTIONS: 10 x 5 = 50

3. Muscles of Mastication.
4. Describe the Arterial supply of spinal cord.
5. What are the palmar spaces. Describe boundaries of mid-palmar space with a noteon its clinical aspects.
6. Hyaline cartilage
7. Development of thyroid gland.
8. Nerve supply of larynx with applied anatomy
9. Sub division of intraembryonic mesoderm. Write derivatives of paraxial mesoderm.
10. Deltoid muscle orign, insertion, nerves supply and action.
11. Explain the genetic basis and clinical features of tuner's syndrome.
12. Attitude and responsibility of medical students towards a cadaver.

### MULTIPLE CHOICE QUESTIONS. 20 x 1 = 20

13. The most common site of fracture of the clavicle is

(A) Medial end
(B) Lateral end
(C) Mid point of the clavicle
(D) Junction of medial 2/3rd and lateral 2/3rd

14. The glenoid cavity particulates with the head of humerus by
(A) Fibres articulation
(B) Cartilaginous articulation
(C) Ball and socket synovial articulation
(D) Plane synovial articulation

15. The surgical neck of humerus is related to the
(A) Radial nerve
(B) Axillary nerve
(C) Ulnar nerve
(D) Median nerve

16. The delto pectoral groove contains
(A) Deltoid branch of lateral thoracic artery
(B) Cephalic vein
(C) Apical group of axillary lymph nodes.
(D) All the above.

17. The breast is supplied by
(A) Lateral thoracic artery
(B) Internal thoracic artery
(C) Intercostals arteries.
(D) All the above.

18. In Erb's paralysis the deformity is called
(A) Claw hand
(B) Wrist drop
(C) Policeman's tip position
(D) Ape hand

19. Paralysis of which muscle causes drooping of the upper eye lid (ptosis)
(A) Occipito Frontalis
(B) Orbicularis Oculi
(C) Levator palpebrae superioris
(D) Superior rectus

20. Which muscle is supplied by the glossopharyngeal nerve
(A) Stylohyoid muscle
(B) Stylopharyngeus
(C) Salphingopharyngus
(D) Palatopharygeus

21. Which muscle tenses the vocal cord?
(A) Thyroeritinoid
(B) Lateral cricoarytenoid

(C) Posterior cricoarytenoid
(D) Crico thryroid

22. The parotid duct opens into vestibule of the mouth at the level of which molar tooth.
(A) Upper first
(B) Lower first
(C) Upper second
(D) Lower second

23. Which nerve carries general sensation from anterior 2/3rd of tongue?
(A) Lingual
(B) Chorda tympani
(C) Glossopharyngeal
(D) Vagus

24. Anterior tubercle of which cervical vertebra is called as Carotid tubercle?
(A) Fourth
(B) Fifth
(C) Sixth
(D) Seventh

25. Which type of joint is median atlanto axial joint?
(A) Plain
(B) Pivot
(C) Ellipsoid
(D) Saddle

26. The lateral ventricle communicates with the third ventricle through
(A) Aqueduct of sylvius
(B) Foramen of magendie
(C) Foramen of Monro
(D) Foramen of Luschka

27. The central canal of spinal cord opens out into the
(A) Sub archnoid space
(B) Lumbar cistern
(C) Third ventricle
(D) Fourth ventricle

28. The brain stem is formed of
(A) Medulla oblongata
(B) Mid brain
(C) Pons
(D) All the above.

29. Primary fissure of the cerebellum separates the
(A) Superior surface from the inferior surface

(B) Anterior lobe from posterior lobe
(C) Paleocerebellum from neocerebellum
(D) None of the above.

30. The superior cerebellar peduncle connects the cerebellum with
(A) Pons
(B) Mid brain
(C) Inferior Olive
(D) Medulla

31. Which muscle brings about retraction of the mandible?
(A) Masseter
(B) Posterior fibres of temporalis
(C) Medial pterygoid
(D) Lateral pterygoid

32. At the age of how many months anterior fontanelle closes?
(A) 6 months
(B) 12 months
(C) 18 months
(D) 24 months

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# NEELIMA INSTITUTE OF MEDICAL SCIENCES

## DEPARTMENMT OF ANATOMY

### 1st MBBS EXAMINATION - MODEL PAPER - II

TIME : 3 Hrs. Max. Marks: 100

Note: Answer all questions, Illustrate your answers with diagrams wherever necessary.

LONG ESSAY QUESTIONS 2 X 15 = 30

1. A 50 years old male patient came to surgical OPD with history of passing blood during defecation and protrusion of mass through anus. 1+8+3+3

(A) Evaluate the probable diagnosis
(B) Discuss the general features of involved organ
(C) Write relations
(D) Write blood supply.

2. Describe the arches of foot under the following headings 2+5+5+3

(A) Write the types
(B) Formation
(C) Write the factors maintaining the arches
(D) Write clinical anatomy

SHORT ESSAY QUESTIONS: 10 x 5 = 50

3. Describe the origin, course, tributaries and termination of azygos vein in detail. 1+1+2+1
4. Embryological basis of accessory pancreatic duct.
5. Describe the adductor magnus muscle and its importance. 3+2
6. Explain the Hessalbach's triangle and its applied aspects. 3+2
7. Draw a neat labeled diagram of histology of testis and write about its functionalcorrelation. 3+2
8. Describe the pleural recesses. Add a note on their applied anatomy. 3+2
9. Draw a neat labelled diagram of micro anatomy of pancreas with description offunctional correlation. 3+2
10. Explain typical intercostal nerve.
11. Describe blood supply of heart.
12. Describe the supports of uterus.

MULTIPLE CHOICE QUESTIONS. 20 x 1 = 20

13. Which is the most common site for the appendix found at appendectomy.

(A) Retro-ileal
(B) Retro-caecal
(C) Pelvic
(D) Anterior to terminal ileum

14. The ejaculatory ducts
(A) The form by union of prostatic ducts and ducts of seminal vesicle
(B) Lies on the superior surface of the bladder
(C) Open into membranous urethra
(D) Contract with parasympathetic stimulation

15. The ureter passes deep to the
(A) Femoral nerve
(B) Gonadal artery
(C) Psoas muscle
(D) Genitofemoral nerve

16. Cremastric artery is a branch of
(A) Aorta
(B) Inferier epi gastric artery
(C) External pundendal
(D) Internal pundendal
(E) External iliac

17. Median umbilical fold lies between
(A) Conjoint tendon and fascia transversalis
(B) Parietal and visceral peritoneum
(C) facia transversalis and parietal peritoneum
(D) Rectus abdominis and posterior rectus sheath

18. The first part of duodenum
(A) Lies at the level of L2
(B) It is approximately 10cms long in the adult
(C) Partially over lies the right crus of diaphragm and Psoas muscle
(D) Is entirely retro peritoneal

19. Which of the following forms posterior wall of the inguinal canal
(A) Conjoint tendon
(B) Internal oblique muscle
(C) Transversus abdominus muscle
(D) Lacunar ligament
(E) External oblique muscle

20. The spleen
(A) Is a retroperitoneal organ
(B) Lies along the axis of left $10^{th}$ rib
(C) Lymphatics drain to the superior mesenteric para-aortic nodes
(D) Pain fibres accompany sympathetic fibres

21. Pelvic joint and ligaments
(A) Muscles of pelvis include obturator externus and piriformis
(B) Piriformis arises from the lower 3rd part of sacrum
(C) The sigmoid colon becomes the section at the level of 4th part of sacrum
(D) The rectum has no mesentry

22.Referred pain from which organ may be felt in the cutaneous distribution of theobturator nerve?
(A) Bladder
(B) Prostate
(C) Ovary
(D) Uterus
(E) Sigmoid colon

**23.** Within the anal canal are anal cushion
(A) 3,7 and 11'O clock
(B) 2,6 and 10'O clock
(C) 3,6 and 11'O clock
(D) 1,7 and 12'O clock
(E) 1,7 and 9'O clock

**24.** Lymph drainage of the scrotum is
(A) Superficial inguinal nodes
(B) Internal iliac nodes
(C) Deep inguinal nodes
(D) External iliac nodes

**25.** The highest branch of the abdominal aorta is
(A) Right supra renal artery
(B) Celiac trunck
(C) Left renal artery
(D) Left gonadal artery
(E) Superior mesenteric artery

**26.** The main vessel suppling the body of the pancreas is
(A) Superior pancreaticoduodenal artery
(B) Splenic artery
(C) Left gastric artery
(D) Left gastroepiploic artery
(E) Inferior pancreaticoduodenal artery

**27.** The abdominal aorta is crossed anteriorly by
(A) Left renal artery
(B) Inferior mesenteric artery
(C) Left renal vein
(D) Right gonadal artery

(E) Right renal vein

**28.** Direct tributaries of portal vein include all but
(A) Right gastric vein
(B) Short gastric vein
(C) Splenic vein
(D) Superior pancreaticoduodenal vein
(E) Left gastric vein

**29.** The liver
(A) Is divided into superior and inferior lobes by falciform ligament
(B) Has a bare area inferiorly
(C) Receives blood from portal and hepatic veins
(D) Has caudate lobe that lies with in lesser sac
(E) Take sympathetic nerve supply from paravertebral ganglia

**30.** Which of the following part of respiratory airway is devoid of glands
(A) Primary bronchus
(B) Secondary bronchus
(C) Tertiary bronchus
(D) Bronchiole

**31.** Which of the following spermatogenic cells lies outside the blood-testis barrier?
(A) Spermatogonia
(B) Primary spermatocyte
(C) Secondary spermatocyte
(D) Spermatid

**32.** Ovum in which of the following ovarian follicle lac zona pellucida?
(A) Primary
(B) Primordial
(C) Secondary
(D) Graafian

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# PHYSIOLOGY (CODE: PY)

## PHYSIOLOGY SYLLABUS

**Based on competencies**

**PAPER - I**

**(A) General Physiology including cell and membrane physiology**
**(B) Blood (Hematology)**
**(C) Cardiovascular Physiology**
**(D) Respiratory Physiology including Environmental Physiology**
**(E) Gastro intestinal physiology**
**(F) Renal and excretory physiology**
**(G) AETCOM**

**PAPER - II**

**(A) Nerve muscle physiology**
**(B) Neuro physiology (CNS + special senses)**
**(C) Endocrine physiology**
**(D) Integrated physiology**
**(E) AETCOM**

| Competency Code | Topic | No. Of Competencies |
|---|---|---|
| PY - 1 | General Physiology | 09 |
| PY - 2 | Hematology | 13 |
| PY - 3 | Nerve and muscle physiology | 17 |
| PY - 4 | Gastro intestinal physiology | 09 |
| PY - 5 | Cardio vascular system | 11 |
| PY - 6 | Respiratory physiology | 07 |
| PY - 07 | Renal Physiology | 09 |
| PY - 08 | Endocrime Physiology | 06 |
| PY - 09 | Reproductive physiology | 12 |
| PY - 10 | Neuro Physiology | 20 |
| PY - 11 | Integrated Physiology | 14 |

## Recommended Books for M.B.B.S 1st Year (Physiology)

1. Text book of Medical Physiology - Guyton & Hall
2. Text book of Medical physiology - D. Venkatesh, H H Sudhakar
3. Text book of Medical physiology - G K Pal
4. Text book of Medical physiology - L P R
5. Practical books: Manual of Practical physiology for MBBS - A K Jain
   A text book of Practical Physiology - Ghai C L

## EXAMINATION PATTERN FOR 1st YEAR MBBS

### Pattern of University theory question paper

## Physiology - 2 papers each

**Each paper carries 100 marks.**

1. Essay questions - 2 x 15 = 30 marks
2. Short questions - 10 x 5 = 50 marks
3. MCQs - 20 x 1 = 20 marks

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100 marks

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### Pattern of University practical examination

| **Practicals** | | **80 marks** |
|---|---|---|
| (A) Hematology Experiment | | 20 marks |
| - Major | (15 M) | |
| - Minor | (05 M) | |
| (B) Human Experiment | | 20 marks |
| - Major | (15 M) | |
| - Minor | (05 M) | |
| (C) Clinical Physiology | | 20 marks |
| - Major 1 | (10 M) | |
| - Major 2 | (10 M) | |
| (D) ECG | | 10 marks |
| (E) Clinical graph / charts / problem | | 10 marks |

| **Viva Voce** | **20 marks** |
|---|---|
| (A) Ex 1 | (05M) |
| (B) Ex 2 | (05M) |
| (C) Ex 3 | (05M) |
| (D) Ex 4 | (05M) |

## NEELIMA INSTITUTE OF MEDICAL SCIENCES

DEPARTMENMT OF PHYSIOLOGY 1st MBBS

EXAMINATION - MODEL PAPER- I

TIME: 3 Hrs. Max. Marks: 100

**Note: Answer all questions, illustrate your answers with diagrams wherever necessary.**

### LONG ESSAY QUESTIONS 2 X 15 = 30

1. An 18 year old boy met with an accident and came to the hospital with severe bleeding.History revealed that even on minor injuries he suffered from severe bleeding repeatedlyand had similar history in the family. (1+8+3+3= 15)

a) Write the likely diagnosis.

b) Describe the physiological mechanisms of blood coagulation in our body

c) Name any three anticoagulants with their mechanism of action.

d) Explain the pathophysiology of this condition and write the treatment.

2. A 35 year old male person presented with symptom of epigastric pain on empty stomachand got relief from pain after taking food. (1+5+6+3=15)

a) Write the diagnosis.

b) Describe in detail about the mechanism of HCL secretion.

c) Describe the factors influencing HCL secretion.

d) Add a note on Migrating Motor Complex

### SHORT ESSAY QUESTIONS: 10 X 5= 50

3. Explain the intrinsic mechanism of blood clotting.
4. Describe the characteristic features of coronary circulation.
5. Explain the counter current multiplier system in kidney.
6. Describe the mechanism of cell mediated immunity.
7. A male aged 55 years was brought to emergency department with history of retro sternal pain since morning, pain in epigastrium radiating to left shoulder, profuse sweating. He isa known diabetic and hypertensive on irregular treatment.
    a) Mention the probable diagnosis
    b) Write the expected ECG changes in this condition
    c) Why is the sub endocardium more prone to Ischaemia?
8. Explain the different lung volumes and capacities with a neat labelled diagram

9. Describe the functions of exocrine pancreatic juice and its regulation
10. Explain the micturition reflex and its higher control.
11. Describe the factors affecting the Oxygen Dissociation Curve
12. Describe the importance of Empathy in Patient encounter.

## MULTIPLE CHOICE QUESTIONS

20 x 1 = 20

13. Smooth endoplasmic reticulum forms
    (a) Proteins
    (b) Lipids
    (c) Carbohydrates
    (d) Steroids

14. The type of intercellular connection through which the molecules move easily is
    (a) Desmosomes
    (b) Gap junction
    (c) Tight junction
    (d) Ion channels
15. Fibrinogen is converted into fibrin by
    (a) Thrombin
    (b) Prothrombin
    (c) Prothrombin activator
    (d) Calcium
16. ESR decreases in
    (a) Infections
    (b) Tuberculosis
    (c) Rheumatoid arthritis
    (d) Polycythemia
17. Oxidation of ferrous iron to ferric iron forms
    (a) Carboxyhemoglobin
    (b) Oxyhemoglobin
    (c) Methemoglobin
    (d) Sulfhemoglobin
18. Bleeding time is prolonged in
    (a) Afibrinogenemia
    (b) Hemophilia
    (c) Christmas disease
    (d) Purpura
19. The cause for depolarization in ventricular muscle action potential is
    (a) Entry of sodium ions
    (b) Exit of potassium ions
    (c) Entry of calcium ions
    (d) Entry of chloride ions

20. Long absolute refractory period in a cardiac muscle is useful as
    (a) It cannot be tetanized
    (b) It improves efficiency
    (c) It decreases excitability
    (d) It prolongs contraction

21. Stimulation of baroreceptor results in
    (a) Increased respiratory rate
    (b) Inhibition of vasomotor center
    (c) Increased heart rate
    (d) Increased peripheral resistance

22. Marey's law states that
    (a) Heart rate varies directly as blood pressure
    (b) Heart rate varies inversely as blood pressure
    (c) Heart rate and blood pressure do not have any relationship
    (d) Heart rate varies directly as the cardiac output
23. First heart sound is produced due to closure of
    (a) Semilunar valves
    (b) Mitral valve
    (c) Tricuspid valve
    (d) Both mitral and tricuspid valves

24. Sham feeding experiment proves the
    (a) Cephalic phase of gastric secretion
    (b) Gastric phase
    (c) Intestinal phase
    (d) Inter digestive phase

25. Pancreatic juice mainly contains
    (a) Bicarbonate ions
    (b) Calcium ions
    (c) Chloride ions
    (d) Sodium ions
26. Decreased salivation occurs due to
    (a) Parasympathetic stimulation
    (b) Eating favourite foods
    (c) Atropine administration
    (d) Presence of irritating food in stomach

27. Ureter is the continuation of
    (a) Pelvis
    (b) Pyramid
    (c) Cortex
    (d) Bowman's capsule

28. The efferent arteriole of juxtamedullary nephron divides into capillary network to form
    (a) Vasa recta
    (b) Peritubular capillary
    (c) Glomerulus
    (d) Renal vein

29. Residual volume can be measured by
    (a) Nitrogen washout method
    (b) Spirometer
    (c) Stethography
    (d) Ballistocardiography

30. Circulatory shock is an example of
    (a) Hypoxic hypoxia
    (b) Stagnant hypoxia
    (c) Histotoxic hypoxia
    (d) Anemic hypoxia

31. The gas responsible of the causation of decompression sickness is
    (a) Oxygen
    (b) Carbon dioxide
    (c) Nitrogen
    (d) Helium

32. Periodic breathing characterized by alternate apnea and hyperventilation is termed as
    (a) Biot's breathing
    (b) Kussmaul breathing
    (c) Cheyne-stokes breathing
    (d) Dyspneic breathing

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## NEELIMA INSTITUTE OF MEDICAL SCIENCES

## DEPARTMENT OF PHYSIOLOGY

### 1st MBBS EXAMINATION - MODEL PAPER-II

TIME : 3 Hrs. Max. Marks: 100

**Note: Answer all questions, illustrate your answers with diagrams wherever necessary.**

LONG ESSAY QUESTIONS 2 X 15 = 30

1. An elderly male came to OPD with history of tremors at rest. On examination, he had cogwheel rigidity, difficulty in walking. (1+6+6+2=15)
   a) Write the probable diagnosis
   b) Describe the components and connections of the structure affected in this condition
   c) Explain the pathophysiology of this disease condition
   d) Write the treatment for this condition.

2. A 40 year old female presented to clinic complaining of excessive tiredness, intolerance to cold, loss of hair and constipation. She also says that she has recently gained weight without significant increase in intake of food. (1+6+8=15)

a) Write the probable diagnosis of the above condition.

b) Explain in detail about the synthesis of the above hormones.

c) Describe the functions of the above hormones.

SHORT ESSAY QUESTIONS: 10 X 5= 50

3. Path of Reflex Arc
4. EEG pattern and waves produced in different conditions
5. Corpus luteum
6. Milk ejection Reflex
7. Organ of Corti
8. List Catecholamines and write the functions of Catecholamines
9. Explain Wallerian degeneration
10. Describe the uterine changes during Menstrual Cycle.
11. Klinifelter's Syndrome

12. Describe the functions of Basal ganglia

MULTIPLE CHOICE QUESTIONS. 20 x 1 = 20

13. In isotonic contraction
    (a) Length of the muscle increases
    (b) Tone of the muscle changes
    (c) Tone remains the same
    (d) Length remains the same

14. Myasthenia gravis is produced due to
    (a) Defective production of acetylcholine
    (b) Excessive destruction of acetylcholine
    (c) Delayed breakdown of acetylcholine
    (d) Destruction of acetylcholine receptors

15. Transport of substances from the cell body to the nerve terminal occurs by
    (a) Orthodromic conduction
    (b) Antidromic conduction
    (c) Salutatory conduction
    (d) Axoplasmic flow

16. The calcium-binding protein which acts as second messenger is
    (a) Calmodulin
    (b) cAMP
    (c) CGMP
    (d) Adenosine

17. The receptor for inverse stretch reflex is
    (a) Muscle spindle
    (b) Golgi tendon organ
    (c) Pacinian corpuscles
    (d) Ruffini's end organ

18. An example of inhibitory neurotransmitter is
    (a) Acetylcholine
    (b) Epinephrine
    (c) Histamine
    (d) GABA
19. The perception of pain in the region of skin away from the site of its production internallyis
    (a) Referred pain

(b) Visceral pain
(c) Somatic pain
(d) Slow pain

20. Primary auditory area corresponds to Brodmann area number
(a) 3, 1, 2
(b) 4, 6
(c) 18,19
(d) 41, 42

21. Majority of the fibres of the pyramidal tract cross to the opposite side at the lowerborder of
(a) Pons
(b) Midbrain
(c) Medulla
(d) Internal capsule

22. The regulation of thyroid hormone secretion is an example of
(a) Positive feedback
(b) Negative feedback
(c) Bio feedback
(d) Down regulation

23. Nephrogenic diabetes insipidus is due to
(a) reduced secretion of vasopressin
(b) nonresponsive kidney for ADH secretion
(c) increased secretion of ADH
(d) Increased water intake

24. Trousseau's sign is test for detecting
(a) Tetanus
(b) Tetany
(c) Cretinism
(d) Cushing's syndrome

25. The remains of Graafian follicle after extrusion of ovum is called
(a) Primordial follicle
(b) Corona radiate
(c) Cumulus oophorus
(d) Corpus luteum

26. Transport of progesterone occurs mainly by
    (a) Binding with albumin
    (b) Binding with globulin
    (c) Binding with prealbumin
    (d) Free form

27. The infant doubles its weight by
    (a) 3 months
    (b) 6 months
    (c) 9 months
    (d) 12 months

28. Aging results in increase in
    (a) Vital capacity
    (b) Functional residual capacity
    (c) Tidal volume
    (d) Residual volume

29. Heat loss center is present in
    (a) Lateral pons
    (b) Medial pons
    (c) Anterior hypothalamus
    (d) Posterior hypothalamus

30. The ability of muscle to perform sustained action is
    (a) Strength
    (b) Power
    (c) Endurance
    (d) Efficiency

31. The number of ATP molecules produced by fully oxidized fat molecule is
    (a) 3
    (b) 10
    (c) 39
    (d) 129

32. The heart rate at birth is around
    (a) 80 beats/min
    (b) 100 beats/min
    (c) 120 beats/min
    (d) 140 beats/min

## MENTOR MENTEE PROGRAMME

**Benefits of mentoring:**

| Mentees | Mentors | Institution |
|---|---|---|
| Attainment of clinical knowledge and skills | Personal and professional development | Retention and recruitment of students and trainees |
| Personal and professional development through constructive feedback and observing positive role models | Development of communication and teaching skills | Widening access to medicine – forging links with under-represented communities to enable upward social mobility |
| Development of communication skills | Leadership skills | Positive role modelling |
| Socialization of the profession – enables students to network | Personal satisfaction | Positive role modelling |
| Insight into subspecialty training and career guidance. e.g. portfolio preparation | Guide by the side | Potential for increased research output |
| Opportunities for research involvement | Collaborator | Sustainable out come |
| | | Student exchange program |

## ANNEXURE – II: Disciplinary Action against Students – Provisions

1.1 Student's behavior and discipline will be assessed and will receive the same attention as the academic work. Discipline includes the observance of good conduct and orderly behavior by the students of the University.

1.2 All students pursuing a Program at the University shall observe code of conduct and maintain discipline and must consider it as a duty to behave decently at all places.

1.3 Every student shall always carry the Identity card issued by the University. Every student shall have to produce or surrender the identity card, as and when required by the proctorial staff, teaching and library staff and the officials of the university. The loss of the identity card, whenever it occurs, shall immediately be reported in writing to the Registrar.

1.4 Any violation of the code of conduct or breach of any rules and regulations of the University is construed as an act of indiscipline and shall make him / her liable for disciplinary action.

1.5 The following acts are treated as gross indiscipline.

a) Disobeying the teacher/officials or misbehaving in the class.
b) Quarrelling or fighting in the University campus or in the hostels amongst themselves, or indulging in any activity which amounts to ragging or harassment of other students.
c) Quarrelling or fighting with a university employee(s) or any other public utility functionaries in the campus.
d) Indecent behavior in the campus or outside causing inconvenience to others.
e) Visiting socially unacceptable websites, smoking or consuming liquor or banned substances like drugs etc.
f) Damage to the University property.
g) Indulging in acts of theft, forgery, stealing and misappropriating.
h) Any other activity that defames the University;
    i. Use of mobile in the class/academic area.
    ii. Irregularity in attending classes, persistent idleness, negligence or indifference towards the work assigned.
    iii. Any other conduct which is considered to be unbecoming of student.

## ANNEXURE – III: Rules for Students Conduct & Behavior in Campus and Outside

The rules and regulations, academic calendar shall be provided to students. In general, Dean - Student Affairs will deal with the welfare and discipline of all students in the campus including Hostel and also outside the campus and will ensure maintenance of good conduct. He/she will be assisted by other members of faculty/ staff/ wardens as nominated.

### 1. Conduct and Behavior:

- Students should attend all their classes and strictly observe class timings. They should likewise carry out other out-door and extracurricular duties assigned to them. Their attendance and leave are governed by the regulations pertaining to them.
- Students must give their undivided attention to their academic work and must be respectful to their teachers and supervisors.
- Students must conduct themselves with due decorum in the classes, laboratories, library etc. and move in an orderly and disciplined manner in the campus.
- Students should not indulge in abusive behavior/ violence of any kind with fellow students, teaching faculty and employees of the University within or outside the University. Violence by any student or group of students will lead to severe disciplinary action.
- No meeting of the students other than those organized under the aegis of the various recognized students' activities shall be called without the prior permission in writing from the Dean, Student Affairs.
- Neither meetings/functions within the University campus shall be organized nor an outsider addresses the students without the prior permission in writing from the Registrar.
- No students shall use unfair means at any of the examinations and tests or attempt or threaten the staff to get undue advantage.
- Students must pay all fees and other dues on specified dates. If they do not do so, they render themselves liable to penalties as in force from time to time.

- Students must take good care of all University property. Any damage to University property shall be viewed as indiscipline. Such students, in addition to facing the disciplinary action, shall have to replace the damaged property and make good the losses caused due to their action. Students must use the furniture and fittings with due care and must not deface buildings, roads, furniture and fittings etc. in any manner.
- Students must handle the laboratory equipment, instruments and machinery with great care. Any damage or breakage of such equipment etc., due to improper use and negligent handling will have to be made good by the students concerned.
- Ragging in any form is unlawful and strictly prohibited. If a student is found in ragging activity he/she shall be punished as per the Anti-Ragging Act.
- The University shall have a zero-tolerance policy towards Ragging and shall lay down strict guidelines on the same as per policies of the UGC in vogue and in compliance to directions of Hon'ble Supreme Court.
- Mobile/cellular phone shall be kept in silent mode during the classes and violation will lead to confiscation of the mobile phone.
- All the students are required to observe the decorum in the dress code as prescribed by the University. Students not adhering to the prescribed dress code may be denied entry to the University campus;
- Smoking, consumption/possession of liquor, intoxicants, drugs, cigarettes, hookah etc., inside or outside the Campus is strictly prohibited. Any violation will invoke severe penalty including rustication from the Hostel/University.

## 2. Policy to prevent Sexual Harassment:

- The University shall be committed to treating every employee and student with dignity and respect. It shall seek to create a work environment that is free from sexual harassment of any kind, whether verbal, physical or visual;
- A policy shall be prescribed by the University to provide guidelines for prompt redressal of complaints related to sexual harassment which should be in full compliance with "The Sexual Harassment of Women at Workplace (Prevention, Prohibition & Redressal)" Act, 2013;
- All references / complaints and redressal mechanism pertaining to any matter will be handled within the ambit of the said Act and the Rules framed there under. The policy so prescribed shall be communicated to all employees and students.

## 3. Grievance and Redressal Mechanisms:

- The University shall constitute various Grievance and Redressal committees and its guidelines as specified by the statutory authorities of the University.

## ANNEXURE – IV: Malpractices Rules

| S.No | Nature of Malpractice Improper conduct during examinations | Punishment |
|---|---|---|
| | ***If the candidate***: | |
| 1.<br><br>(a) | Possesses or keeps accessible in examination hall, any paper, note book, programmable calculators, Cell phones, pager, palm computers or any other form of material concerned with or related to the subject of the examination (theory or practical) in which he/she is appearing but has not made use of (material shall include any marks on the body of the candidate which can be used as an aid in the subject of the examination) | Expulsion from the examination hall and cancellation of the performance in that subject only. |
| (b) | Gives assistance or guidance or receives it from any other candidate orally or by any other body language methods or communicates through cell phones with any candidate or persons in or outside the exam hall in respect of any matter. | Expulsion from the examination hall and cancellation of the performance in that subject only of all the candidates involved. In case of an outsider, he/she will be handed over to the police and a case is registered against him/her. |
| 2. | Has copied in the examination hall from any paper, book, programmable calculators, palm computers or any other form of material relevant to the subject of the examination (theory or practical) in which the candidate disappearing. | Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted to appear for the remaining examinations of the subjects of that Semester/year. The hall ticket of the candidate is to be cancelled. |

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| 3. | Impersonates any other candidate in connection with the examination. | The candidate who has impersonated shall be expelled from examination hall. The candidate is also debarred and forfeits the seat. The performance of the original candidate, who has been impersonated, shall be cancelled in all the subjects of the examination (including practicals and project work) already appeared and shall not be allowed to appear for examinations of the remaining subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all Semester end examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat. If the imposter is an outsider, he/she will be handed over to the police and a case is registered against him/her. |
| 4. | Smuggles in the Answer book or additional sheet or takes out or arranges to send out the question paper during the examination. Takes away answer book or additional sheet, during or after the examination. | Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all SEEs. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat. |
| 5 | Uses objectionable, abusive or offensive language in the answer paper or in letters to the examiners or writes to the examiner requesting him to award pass marks | Cancellation of the performance in that subject. |

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| 6 | Refuses to obey the orders of the Chief Superintendent / Assistant Superintendent / any officer on duty or misbehaves or creates disturbance of any kind in and around the examination hall or organizes a walk out or instigates others to walk out, or threatens the officer-in charge or any person on duty inside or outside the examination hall or causing any injury to himself / herself or to any others or threatens whether by words, either spoken or written or by signs or by visible representation, assaults the officer in-charge, or any person on duty in or outside the examination hall or any others, or indulges in any other act of misconduct or mischief which result in damage to or destruction of property in the examination hall or any part of the college campus or engages in any other act which in the opinion of the officer on duty amounts to use of unfair means or misconduct or has the tendency to disrupt the orderly conduct of the examination. | They shall be expelled from examination halls and cancellation of their performance in that subject and all other subjects the candidate(s) has (have) already appeared and shall not be permitted to appear for the remaining examinations of the subjects of that semester/year. The candidates also are debarred and forfeit their seats. In case of outsiders, they will be handed over to the police and a police case will be registered against them. |
| 7. | Leaves the exam hall taking away answer script or intentionally tears the script or any part-thereof inside or outside the examination hall. | Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects the candidate has already appeared including practical examinations and project work & shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all Semester examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat. |
| 8. | Possess any lethal weapon or firearm in the examination hall. | Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has |

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| | | already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred and forfeits these at. |
| 9. | Who is not a candidate for the particular examination or any person not connected with the University indulges in any malpractice or improper conduct mentioned in clause 6 to 8. | Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred and forfeits the seat. Person(s) who do not belong to the University will be handed over to police and, a police case will be registered against them. |
| 10. | Comes in a drunken condition to the examination hall. | Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. |
| 11. | Copying detected on the basis of internal evidence, such as, during valuation or during special scrutiny. | Cancellation of the performance in that subject and all other subjects the candidate has appeared including practical examinations and project work of that semester/year examinations. |
| 12. | If any malpractice is detected which is not covered in the above clauses 1 to 11 shall be reported to the malpractice committee for further action on suitable punishment as per rules. | |

## ANNEXURE – V: Anti ragging Guidelines

- **Definition of Ragging** - Ragging shall mean any disorderly conduct, whether by words spoken or written orby an act which has the effect of teasing, treating or handling with rudeness any other student, indulging in rowdy or undisciplined activities which causes or is likely to cause annoyance, hardship or psychological harm or to raise fear or apprehension thereof in a fresher or a junior student or asking the students to do any act or perform something which such student will not in the ordinary course and which has the effect of causing or generating a sense of shame or embarrassment so as to adversely affect the physique or psyche of a fresher or a junior student.
- Ragging is regarded as a serious offence and is totally Prohibited in our Institute.
- Anyone found guilty of ragging or abetting ragging, whether actively or passively, or being a part of a conspiracy to promote ragging, is liable to be punished in accordance with the regulations published in the official Gazette of NMC dated 18 Nov. 2021and as well as under the provisions of any penal law for the time being in force.
- **Anti-Ragging Committee**: An Anti-ragging committee is constituted by the Dean which would be ensuring that the Anti ragging guidelines are enforced strictly in the institute. The Committee includes Dean, faculty, hostel wardens, representatives of fresher's, senior student's, non-teaching staff and other senior members.
- The duties of the Committee are as follows:
    a) The Committee members on rotation would have a close surveillance and appropriate
    b) Monitoring on all the vulnerable areas for ragging such as hostel premises, canteen, mess, library, gymnasium and any other facility to be monitored.
    c) Overall monitoring of Anti ragging activities
    d) Ensuring that the anti-ragging guidelines are strictly adhered to
    e) Monitoring the activities of Anti ragging squad
    f) Investigate the reports of ragging if any
    g) To make suggestions for improving the Anti ragging measures in the institute.
- **Anti-Ragging Squad**: An Anti-ragging squad is constituted by the Dean and broadly comprise of faculty and staff of the hostels including wardens and other staff, as necessary. A judicious mix of gender in the Squad is taken care of with lady members assigned to ladies hostels.

- The duties of Anti ragging squad are:
    a) Adhering to the duty roster as notified according to the orders of the Dean.
    b) Remaining vigilant and agile at all times and also provide necessary details so that the members are easily reachable even by freshers and other students.
    c) Making surprise checks in the hostels, boarding areas, playgrounds and transport facilities and other areas even at odd hours.
    d) Making discrete enquiries regarding compliance and adherence of the Anti-ragging regulations by the senior students.
    e) Making on the spot enquiries on incidents of ragging and report them to the Anti-Ragging Committee and Dean.
    f) Conducting anonymous surveys at random, to identify possibly unreported incidents of ragging.
    g) Checking freshers for any injuries or indirect evidences of possible ragging such as inability to stay awake during the day indicating possible ragging throughout the night or inability to sleep due to fear of ragging.
    h) Informing the authorities concerned to rectify vulnerable areas such as dark stretches due to fused bulbs etc.
    i) Making entries regarding timings and details of checking including remarks or findings, if any, in a register.

- **Mentoring Committee:**

  Constituted by the faculty who volunteer for the mentoring process. Approximately six students are allocated to each faculty member.

- The duties of Mentors are as follows:
    a) They interact individually with the mentee fresher student as and when required for ascertaining the problems or difficulties, if any, faced by the fresher and extend necessary help in overcoming the same.
    b) They coordinate with the wardens of the hostels and make surprise visits to the rooms in such hostels, where the students are lodged
    c) They interact with the parents or guardians of the mentees to discuss and provide solutions to problems faced by the student
    d) They maintain a diary of his/her interaction with the freshers under his charge.

- **Role of Warden in Anti Ragging guidelines enforcement in the institute:**

  Warden is a person designated to take care of administrative affairs, supervise boarding and lodging of students in hostels and ensure that the rules and regulations as applicable are obeyed. The warden:

  a) functions under the Hostel Committee and may be assisted by Deputy / Assistant wardens.
  b) plays an important role in the anti-ragging efforts since the hostels are vulnerable areas, especially after normal academic hours when freshers and senior students are likely to face each other in the hostels.
  c) accessible to the freshers at all times.
  d) empowered to control the security personnel in the hostels for Anti-ragging measures.

- **University Monitoring Committee:**

  Neelima Institute of Medical Sciences is affiliated to Anurag University. The University has a Monitoring Committee and is the prime - mover of implementation of all anti-ragging activities of Neelima Institute of Medical Sciences.

  The Monitoring Committee will ensure:

(a) Compliance to the provisions of the Anti-Ragging regulations in letter and spirit, regularly
(b) Oversee and monitor activities related to Anti-Ragging Committee, Anti-Ragging Squads and Mentoring Committee
(c) Conduct of orientation programme's and counselling sessions.
(d) Investigating the incidents of ragging, reviewing and approving the reports of investigations related to ragging received from the Medical Institute.
(e) Implementation of any suggestions of Improvement done by the institute with regard to Anti – Ragging measures.

- **Steps to curtail Ragging in the Medical Institute:**

(a) At the time of admission an undertaking (in the prescribed format by the NMC – Undertaking by the Student Form - I) will be taken from the student that he / she would not involve in any form of ragging what so ever.
(b) An Undertaking by the Parent / Guardian (Form – II as prescribed by the NMC) will also be taken.
(c) An Orientation session would be conducted for the freshers to appraise and familiarize them with the academic environment of the institute.
(d) The contact numbers of the Anti-ragging committee and Anti ragging squad members will be made available to the freshers so that any undue ragging instances would be reported

immediately and immediate actions to curb such instances can be taken.

(e) The hostel students in the intent of leaving to visit the local guardians/ any other necessity, should obtain prior permission from the warden and make a clear note in the register regarding timing of leaving, expected return, area of visit and the contact details (of persons to be visited).

- **Dealing with Incidents of Ragging:**

**i. Reporting of Incident of Ragging:**

(a) The report or complaint of ragging can be made by a fresher / a parent / other student / authorities of the hostel / security personnel / any other staff such as canteen staff / Head of the Institution / faculty member / members of the Anti-Ragging Squad / Anti-Ragging Committee / Others such as direct complaint to local Police or District Authorities.

(b) In all instances, without exception, the name of the complainant, especially students, unless otherwise permissible, be kept confidential.

(c) The information will be immediately and simultaneously conveyed to the Dean.

(d) Other officials such as members of Anti Ragging committee and Anti Ragging squad, hostel warden, security staff and others will be simultaneously informed.

**ii. Immediate action:**

On receipt of such information the Dean would immediately determine whether to proceed to file a First Information Report within twenty-four hours either on his / her own or through a member of the Anti-Ragging Committee with the police and local authorities, under the appropriate penal provisions.

**iii. Institutional investigation and report:**

(a) The Dean will constitute a specific committee to investigate the incident of ragging.

(b) The investigation would be conducted thoroughly including on-the-spot or site of the incident in a fair and transparent manner, without any bias or prejudice, upholding the principles of natural justice and giving adequate opportunity to the student or students accused of ragging and other witnesses to place before it the facts, documents and views concerning the incident of ragging, and considering such other relevant information as may be required.

(c) The entire process would be completed and a report is duly submitted within seven days of the information or reporting of the incident of ragging.

(d) The report is placed before the Dean or the Anti-Ragging Committee. The Anti-Ragging Committee

will examine the report, decide on and recommend further administrative action to the Dean.

**iv. Institutional administrative and penal actions:**

The Anti-Ragging Committee, on accepting the report of the institutional investigation by the appropriate committee, depending on the nature, gravity and seriousness of the guilt would recommend one or more of the following actions as provided in the Anti Ragging regulations of NMC:

(a) suspension from attending classes and academic privileges

(b) withholding or withdrawing scholarship or fellowship and other benefits

(c) debarring from appearing in any test or examination or other evaluation process withholding results

(d) debarring from attending conferences, and other academic programmes

(e) debarring from representing the institution in any regional, national or international meet, tournament, youth festival, etc.

(f) suspension or expulsion from the hostel

(g) imposition of a fine ranging from twenty-five thousand rupees to one lakh rupees

(h) cancellation of admission

(i) rustication from the Medical Institute for a period ranging from one to four semesters

(j) expulsion from the medical colleges or institutions and consequent debarring from admission to any other institution for a specified period.

The Dean will also inform the University regarding the incident of ragging, with a report regarding the findings of the institutional level of investigation and actions taken thereof.

In situations where the individual person committing an act of ragging is not identified on the basis of the findings of the institutional investigations, and the subsequent recommendations thereof, the Medical Institute would resort to collective punishment of more than one or a group of persons, as deemed fit, as a deterrent to ensure community pressure on the potential raggers.

The Medical Institute while issuing a Migration Certificate or Transfer Certificate would mandatorily enter in it whether the student has been punished for the offence of committing ragging, or not, and also whether the student has displayed persistent violent or aggressive behavior or any inclination to harm others.

**v. Appellate authorities:**

Every student who has been awarded punishments have the right to appeal to the Vice Chancellor of the University.

Note: For further information the student can refer to National Medical Commission Notification guidelines on Anti Ragging published on18th November, 2021 (No. UGMEB/NMC/Rules & Regulations/2021).