**PRAVARA INSTITUTE OF MEDICAL SCIENCES**
**(DEEMED TO BE UNIVERSITY)**
**Loni, Tal. Rahata, Dist. Ahmednagar 413736**
**NAAC Re-accredited with 'A' Grade**

# SYLLABUS

## UG Programme- ANATOMY

### MBBS- I$^{st}$ year

(Competency Based Undergraduate Curriculum will be implemented from August 2019, i.e. MBBS batch admitted for first year in 2019)

| | | | |
|---|---|---|---|
| Course Code | : | Theory Paper I | : MU 101 |
| | | Theory Paper II | : MU 202 |

## CHAPTER I
## GENERAL CONSIDERATIONS AND TEACHING APPROACH

### 1. Introduction

The provisions contained in Part II of these Regulations shall apply to the MBBS course starting from academic year 2019-20 onwards

### 2. Indian Medical Graduate Training Programme

The undergraduate medical education programme is designed with a goal to create an "Indian Medical Graduate" (IMG) possessing requisite knowledge, skills, attitudes, values and responsiveness, so that she or he may function appropriately and effectively as a physician of first contact of the community while being globally relevant. To achieve this, the following national and institutional goals for the learner of the Indian Medical Graduate training programme are hereby prescribed:-

**2.1 National Goals**

At the end of undergraduate program, the Indian Medical Graduate should be able to:

(a)Recognize "health for all" as a national goal and health right of all citizens and by undergoing training for medical profession to fulfil his/her social obligations towards realization of this goal.

(b) Learn every aspect of National policies on health and devote her/him to its practical implementation.

(c)Achieve competence in practice of holistic medicine, encompassing promotive, preventive, curative and rehabilitative aspects of common diseases.

(d)Develop scientific temper, acquire educational experience for proficiency in profession and promote healthy living.

(e)Become exemplary citizen by observance of medical ethics and fulfilling social and professional obligations, so as to respond to national aspirations.

**2.2 Institutional Goals**

(1) In consonance with the national goals each medical institution should evolve institutional goals to define the kind of trained manpower (or professionals) they intend to produce. **The Indian Medical Graduates coming out of a medical institute should:**

(a) be competent in diagnosis and management of common health problems of the individual and the community, commensurate with his/her position as a member of the health team at the primary, secondary or tertiary levels, using his/her clinical skills based on history, physical examination and relevant investigations.

(b) Be competent to practice preventive, promotive, curative, palliative and rehabilitative medicine in respect to the commonly encountered health problems.

(c) Appreciate rationale for different therapeutic modalities; be familiar with the administration of "essential medicines" and their common adverse effects.

(d) Be able to appreciate the socio-psychological, cultural, economic and environmental factors affecting health and develop humane attitude towards the patients in discharging one's professional responsibilities.

(e) possess the attitude for continued self-learning and to seek further expertise or to pursue research in any chosen area of medicine, action research and documentation skills.

(f) Be familiar with the basic factors which are essential for the implementation of the National Health Programmes including practical aspects of the following:

(i) Family Welfare and Maternal and Child Health (MCH)

(ii) Sanitation and water supply

(iii) Prevention and control of communicable and non-communicable diseases

(iv) Immunization

(v) Health Education

(vi) Indian Public Health Standards (IPHS), at various levels of service delivery

(vii) Bio-medical waste disposal

(viii) Organizational and/or institutional arrangements.

(g) acquire basic management skills in the area of human resources, materials and resource management related to health care delivery, hospital management, inventory skills and counseling.

(h) be able to identify community health problems and learn to work to resolve these by designing, instituting corrective steps and evaluating outcome of such measures.

(i) be able to work as a leading partner in health care teams and acquire proficiency in communication skills.

(j) be competent to work in a variety of health care settings.

(k) have personal characteristics and attitudes required for professional life such as personal integrity, sense of responsibility and dependability and ability to relate to or show concern for other individuals.

(2) **All efforts must be made to equip the medical graduate to acquire the skills as detailed in Table 11 Certifiable procedural skills** — A Comprehensive list of skills recommended as desirable for Bachelor of Medicine and Bachelor of Surgery (MBBS) — Indian Medical Graduate.

**2.3 Goals and Roles for the Learner**

In order to fulfil the goal of the IMG training programme, the medical graduate must be able to function in the following roles appropriately and effectively:-

2.3.1 Clinician who understands and provides preventive, promotive, curative, palliative and holistic care with compassion.

2.3.2 Leader and member of the health care team and system with capabilities to collect analyze, synthesize and communicate health data appropriately.

2.3.3 Communicator with patients, families, colleagues and community.

2.3.4 Lifelong learner committed to continuous improvement of skills and knowledge.

2.3.5 Professional, who is committed to excellence, is ethical, responsive and accountable to patients, community and profession.

**3. Competency Based Training Programme of the Indian Medical Graduate**

Competency based learning would include designing and implementing medical education curriculum that focuses on the desired and observable ability in real life situations. In order to effectively fulfil the roles as listed in clause 2, the Indian Medical Graduate would have obtained the following set of competencies at the time of graduation:

**3.1 Clinician, who understands and provides preventive, promotive, curative, palliative and holistic care with compassion**

3.1.1 Demonstrate knowledge of normal human structure, function and development from a molecular, cellular, biologic, clinical, behavioural and social perspective.

3.1.2. Demonstrate knowledge of abnormal human structure, function and development from a molecular, cellular, biological, clinical, behavioural and social perspective.

3.1.3 Demonstrate knowledge of medico-legal, societal, ethical and humanitarian principles that influence health care.

3.1.4 Demonstrate knowledge of national and regional health care policies including the National Health Mission that incorporates National Rural Health Mission (NRHM) and National Urban Health Mission (NUHM), frameworks, economics and systems that influence health promotion, health care delivery, disease prevention, effectiveness, responsiveness, quality and patient safety.

3.1.5 Demonstrate ability to elicit and record from the patient, and other relevant sources including relatives and caregivers, a history that is complete and relevant to disease identification, disease prevention and health promotion.

3.1.6 Demonstrate ability to elicit and record from the patient, and other relevant sources including relatives and caregivers, a history that is contextual to gender, age, vulnerability, social and economic status, patient preferences, beliefs and values.

3.1.7 Demonstrate ability to perform a physical examination that is complete and relevant to disease identification, disease prevention and health promotion.

3.1.8 Demonstrate ability to perform a physical examination that is contextual to gender, social and economic status, patient preferences and values.

3.1.9 Demonstrate effective clinical problem solving, judgment and ability to interpret and integrate available data in order to address patient problems, generate differential diagnoses and develop individualized management plans that include preventive, promotive and therapeutic goals.

3.1.10 Maintain accurate, clear and appropriate record of the patient in conformation with legal and administrative frame works.

3.1.11 Demonstrate ability to choose the appropriate diagnostic tests and interpret these tests based on scientific validity, cost effectiveness and clinical context.

3. l. 12 Demonstrate ability to prescribe and safely administer appropriate therapies including nutritional interventions, pharmacotherapy and interventions based on the principles of rational drug therapy, scientific validity, evidence and cost that conform to established national and regional health programmes and policies for the following:

(i) Disease prevention,

(ii) Health promotion and cure,

(iii) Pain and distress alleviation, and

(iv) Rehabilitation.

3.1.13 Demonstrate ability to provide a continuum of care at the primary and/or secondary level that addresses chronicity, mental and physical disability.

3.1.14 Demonstrate ability to appropriately identify and refer patients who may require specialized or advanced tertiary care.

3.1.15 Demonstrate familiarity with basic, clinical and translational research as it applies to the care of the patient.

**3.2 Leader and member of the health care team and system**

3.2.1 Work effectively and appropriately with colleagues in an inter-professional health care team respecting diversity of roles, responsibilities and competencies of other professionals.

3.2.2 Recognize and function effectively, responsibly and appropriately as a health care team leader in primary and secondary health care settings.

3.2.3 Educate and motivate other members of the team and work in a collaborative and collegial fashion that will help maximize the health care delivery potential of the team.

3.2.4 Access and utilize components of the health care system and health delivery in a manner that is appropriate, cost effective, fair and in compliance with the national health care priorities and policies, as well as be able to collect, analyze and utilize health data.

3.2.5 Participate appropriately and effectively in measures that will advance quality of health care and patient safety within the health care system.

3.2.6 Recognize and advocate health promotion, disease prevention and health care quality improvement through prevention and early recognition: in a) life style diseases and b) cancers, in collaboration with other members of the health care team.

**3.3 Communicator with patients, families, colleagues and community**

3.3.1 Demonstrate ability to communicate adequately, sensitively, effectively and respectfully with patients in a language that the patient understands and in a manner that will improve patient satisfaction and health care outcomes.

3.3.2 Demonstrate ability to establish professional relationships with patients and families that are positive, understanding, humane, ethical, empathetic, and trustworthy.

3.3.3 Demonstrate ability to communicate with patients in a manner respectful of patient's preferences, values, prior experience, beliefs, confidentiality and privacy.

3.3.4 Demonstrate ability to communicate with patients, colleagues and families in a manner that encourages participation and shared decision-making.

**3.4 Lifelong learner committed to continuous improvement of skills and knowledge**

3.4.1 Demonstrate ability to perform an objective self-assessment of knowledge and skills, continue learning, refine existing skills and acquire new skills.

3.4.2 Demonstrate ability to apply newly gained knowledge or skills to the care of the patient.

3.4.3 Demonstrate ability to introspect and utilize experiences, to enhance personal and professional growth and learning.

3.4.4 Demonstrate ability to search (including through electronic means), and critically evaluate the medical literature and apply the information in the care of the patient.

3.4.5 Be able to identify and select an appropriate career pathway that is professionally rewarding and personally fulfilling.

**3.5 Professional who is committed to excellence, is ethical, responsive and accountable to patients, community and the profession**

3.5.1 Practice selflessness, integrity, responsibility, accountability and respect.

3.5.2 Respect and maintain professional boundaries between patients, colleagues and society.

3.5.3 Demonstrate ability to recognize and manage ethical and professional conflicts.
Abide by prescribed ethical and legal codes of conduct and practice.

3.5.4 Demonstrate a commitment to the growth of the medical profession as a whole.

**4. Broad Outline on training format**

4.1 In order to ensure that training is in alignment with the goals and competencies listed in sub-clause 2 and 3 above:

4.1.1 There shall be a"Foundation Course" to orient medical learners to MBBS programme, and provide them with requisite knowledge, communication (including electronic), technical and language skills.

4.1.2 The curricular contents shall be vertically and horizontally aligned and integrated to the maximum extent possible in order to enhance learner's interest and eliminate redundancy and overlap.

4.1.3 Teaching-learning methods shall be learner centric and shall predominantly include small group learning, interactive teaching methods and case based learning.

4.1.4 Clinical training shall emphasize early clinical exposure, skill acquisition, certification in essential skills; community/primary/secondary care-based learning experiences and emergencies.

4.1.5 Training shall primarily focus on preventive and community based approaches to health and disease, with specific emphasis on national health priorities such as family welfare, communicable and non- communicable diseases including cancer, epidemics and disaster management.

4.1.6 Acquisition and certification of skills shall be through experiences in patient care, diagnostic and skill laboratories.

4.1.7 The development of ethical values and overall professional growth as integral part of curriculum shall be emphasized through a structured longitudinal and dedicated programme on professional development including attitude, ethics and communication.

4.1.8 Progress of the medical learner shall be documented through structured periodic assessment that includes formative and summative assessments. Logs of skill-based training shall be also maintained.

4.2 Appropriate Faculty Development Programmes shall be conducted regularly by institutions to facilitate medical teachers at all levels to continuously update their professional and teaching skills, and align their teaching skills to curricular objectives.

**Competency Based Medical Education MBBS Programme Applicable From Academic Year 2019 Onwards**

**Table 1: Time distribution of MBBS Programme & Examination Schedule**

| Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Foundation Course | | I MBBS | | |
| I MBBS | | | | | | | | Exam I MBBS | II MBBS | | |
| II MBBS | | | | | | | | Exam II MBBS | III MBBS | | |
| III MBBS Part I | | | | | | | | | Exam III MBBS Part I | Electives & Skills | |
| III MBBS Part II | | | | | | | | | | | |
| Exam III MBBS Part II | Internship | | | | | | | | | | |
| Internship | | | | | | | | | | | |

- *One month is provided at the end of every professional year for completion of examination and declaration of results.*

**Table 2: Distribution of subjects by Professional Phase**

| Phase & year of MBBS training | Subjects & New Teaching Elements | Duration | University examination |
|---|---|---|---|
| irst Professional MBBS | • Foundation Course (1 month)<br>• Human Anatomy, Physiology & Biochemistry, introduction to Community Medicine, Humanities<br>• Early Clinical Exposure<br>• Attitude, Ethics, and Communication (AETCOM) Module | 1 + 13 months | I Professional |
| econd Professional **MBBS** | • Pathology, Microbiology, Pharmacology, Forensic Medicine and Toxicology,<br>• Introduction to clinical subjects including Community Medicine<br>• Clinical postings<br>• Attitude, Ethics & Communication Module (AETCOM) | 2 months | II Professional |
| hird Professional MBBS Part I | • General Medicine, General Surgery, Obstetrics & Gynaecology, Paediatrics, Orthopaedics, Dermatology, Psychiatry, Otorhinolaryngology, Ophthalmology, Community Medicine, Forensic Medicine and Toxicology, Respiratory medicine, Radio diagnosis & Radiotherapy, Anaesthesiology<br>• Clinical subjects /postings<br>• Attitude, Ethics & Communication Module (AETCOM) | 3 months | III Professional (Part I) |
| lectives | • Electives, Skills and assessment* | 2 mont hs | |
| hird Professional MBBS Part II | • General Medicine, Paediatrics, General Surgery, Orthopaedics, Obstetrics and Gynaecology including Family welfare and allied specialties<br>• Clinical postings/subjects<br>• Attitude, Ethics & Communication Module (AETCOM) | 3 months | III Professional (Part II) |

*Assessment of electives shall be included in Internal Assessment.

**Table 3: Foundation Course (one month)**

| Subjects/ Contents | Teaching hours | Self-Directed Learning (hours) | Total hours |
|---|---|---|---|
| Orientation ’ | 30 | 0 | 30 |
| kills Module | 35 | 0 | 35 |
| ield visit to Community Health Centre | 8 | 0 | 8 |
| ntroduction to Professional Development & AETCOM nodule | | | 40 |
| ports and extracurricular activities | 22 | 0 | 22 |
| nhancement of language/ computer skills[3] | 40 | 0 | 40 |
| | | | 175 |

1. *Orientation course will be completed as single block in the first week and will contain elements outlined in 9.1.*
2. *Skills modules will contain elements outlined in 9.1.*
3. *Based on perceived need of learners, one may choose language enhancement (English or local spoken or both) and computer skills. This should be provided longitudinally through the duration of the Foundation Course.*
4. *Teaching of Foundation Course will be organized by pre-clinical departments.*

**Table 4: First Professional teaching hours**

| **Subjects** | **Lectures** (hours ) | **Small Group Teaching/ Tutorials/ Integrated learning/ Practical (hours)** | **Self-directed learning (hours)** | **Total (hours)** |
|---|---|---|---|---|
| Human Anatomy | 220 | 415 | 40 | 675 |
| Physiology* | 160 | 310 | 25 | 495 |
| Biochemistry | 80 | 150 | 20 | 250 |
| Early Clinical Exposure** | 90 | | 0 | 90 |
| Community Medicine | 20 | 27 | 5 | 52 |
| Attitude, Ethics & Communication Module AETCOM) *** | | 26 | 8 | 34 |
| Sports and extracurricular activities | | | | 60 |
| Formative assessment and Term examinations | | | | 80 |
| Total | | | | 1736 |

**including Molecular Biology.*

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

**** AETCOM module shall be a longitudinal programme.*

**9.** New **teaching / learning elements**

**Foundation Course**

**Goal:** The goal of the Foundation Course is to prepare a learner to study medicine effectively. It will be of one month duration after admission.

**Objectives:** The objectives are to:

**(a) Orient the learner to:**

(i) The medical profession and the physician's role in society

(ii) The MBBS programme

(iii) Alternate health systems in the country and history of medicine

(iv) Medical ethics, attitudes and professionalism

(v) Health care system and its delivery

(vi) National health programmes and policies

(vii) Universal precautions and vaccinations

(viii) Patient safety and biohazard safety

(ix) Principles of primary care (general and community based care)

(x) The academic ambience

**(b) Enable the learner to acquire enhanced skills in:**

(i) Language

(ii) Interpersonal relationships

(iii) Communication

(iv) Learning including self-directed learning

(v) Time management

(vi) Stress management

(vii) Use of information technology

**(c) Train the learner to provide:**

(i) First-aid

(ii) Basic life support

In addition to the above, learners may be enrolled in one of the following programmes which will be run concurrently:

(a) Local language programme

(b) English language programme

(c) Computer skills

(d) These may be done in the last two hours of the day for the duration of the Foundation Course.

These sessions must be as interactive as possible.

Sports (to be used through the Foundation Course as protected 04 hours / week).

Leisure and extracurricular activity (to be used through the Foundation Course as protected 02 hours per week).

Institutions shall develop learning modules and identify the appropriate resource persons for their delivery.

The time committed for the Foundation Course may not be used for any other curricular activity.

The Foundation Course will have compulsory 759c attendance. This will be certified by the Dean of the college.

The Foundation Course will be organized by the Coordinator appointed by the Dean of the college and will be under supervision of the heads of the preclinical departments.

Every college must arrange for a meeting with parents and their wards.

**Early Clinical Exposure**

**Objectives:** The objectives of early clinical exposure of the first-year medical learners are to enable the learner to:

(a) Recognize the relevance of basic sciences in diagnosis, patient care and treatment,

(b) Provide a context that will enhance basic science learning,

(c) Relate to experience of patients as a motivation to learn,

(d) Recognize attitude, ethics and professionalism as integral to the doctor-patient relationship,

(e) Understand the socio-cultural context of disease through the study of humanities.

**Elements**

(a) Basic science correlation: i.e. apply and correlate principles of basic sciences as they relate to the care of the patient (this will be part of integrated modules).

(b) Clinical skills: to include basic skills in interviewing patients, doctor-patient communication, ethics and professionalism, critical thinking and analysis and self-learning (this training will be imparted in the time allotted for early clinical exposure).

(c) Humanities: To introduce learners to a broader understanding of the socio-economic framework and cultural context within which health is delivered through the study of humanities and social sciences.

**Electives**

**Objectives: To** provide the learner with opportunities:

(a) For diverse learning experiences,

(b) To do research/community projects that will stimulate enquiry, self-directed, experiential learning and lateral thinking.

Two months are designated for elective rotations after completion of the examination at end of the third MBBS Part I and before commencement of third MBBS Part II.

It is mandatory for learners to do an elective. The elective time should not be used to make up for missed clinical postings, shortage of attendance or other purposes.

**Structure**

(a) The learner shall rotate through two elective blocks of 04 weeks each.

(b) Block 1 shall be done in a pre-selected preclinical or para-clinical or other basic sciences laboratory OR under a researcher in an ongoing research project.

During the electives regular clinical postings shall continue.

(c) Block 2 shall be done in a clinical department (including specialties, super-specialties, ICUs, blood bank and casualty) from a list of electives developed and available in the institution. OR

as a supervised learning experience at a rural or urban community clinic.

(d) Institutions will pre-determine the number and nature of electives, names of the supervisors, and the number of learners in each elective based on the local conditions, available resources and faculty.

Each institution will develop its own mechanism for allocation of electives.

It is preferable that elective choices are made available to the learners in the beginning of the academic year.

The learner must submit a learning log book based on both blocks of the elective.

75 to attendance in the electives and submission of log book maintained during elective is required for eligibility to appear in the final MBBS examination.

Institutions may use part of this time for strengthening basic skill certification.

**Professional Development including Attitude, Ethics and Communication Module (AETCOM)**

**Objectives** of the programme: At the end of the programme, the learner must demonstrate ability to:

(a) understand and apply principles of bioethics and law as they apply to medical practice and researcunderstand and apply the principles of clinical reasoning as they apply to the care of the patients,

(b) understand and apply the principles of system based care as they relate to the care of the patient,

(c) understand and apply empathy and other human values to the care of the patient,

(d) communicate effectively with patients, families, colleagues and other health care professionals,

(e) understand the strengths and limitations of alternative systems of medicine,

(II respond to events and issues in a professional, considerate and humane fashion,

(g) translate learning from the humanities in order to further his / her professional and personal growth.

**Learning experiences:**

(a) This will be a longitudinal programme spread across the continuum of the MBBS programme including internship,

(b) Learning experiences may include — small group discussions, patient care scenarios, workshop, seminars, role plays, lectures etc.

(c) Attitude, Ethics &Communication Module (AETCOM module) developed by Medical Council of India should be used longitudinally for purposes of instruction.

759c attendance in Professional Development Programme (AETCOM Module) is required for eligibility to appear for final examination in each professional year.

Internal Assessment will include:

(a) Written tests comprising of short notes and creative writing experiences,

(b) OSCE based clinical scenarios / viva voce.

At least one question in each paper of the clinical specialties in the University examination should test knowledge competencies acquired during the professional development programme.

Skill competencies acquired during the Professional Development Programme must be tested during the clinical, practical and viva voce.

**Learner-doctor method of clinical training (Clinical Clerkship)**

**Goal: To** provide learners with experience in:

(a) Longitudinal patient care,

(b) Being part of the health care team,

(c) Hands-on care of patients in outpatient and inpatient setting.

**Structure:**

(a) The first clinical posting in second professional shall orient learners to the patient, their roles and the specialty.

(b) The learner-doctor programme will progress as outlined in Table 9.

(c) The learner will function as a part of the health care team with the following responsibilities:

(i) Be part of the unit's outpatient services on admission days,

(ii) Remain with the admission unit until 6 PM except during designated class hours,

(iii) Be assigned patients admitted during each admission day for whom he/she will undertake responsibility, under the supervision of a senior resident or faculty member,

(iv) Participate in the unit rounds on its admission day and will present the assigned patients to the supervising physician,

(V) Follow the patient's progress throughout the hospital stay until discharge,

(Vi) Participate, under supervision, in procedures, surgeries, deliveries etc. of assigned patients (according to responsibilities outlined in table 9),

(vii) Participate in unit rounds on at least one other day of the week excluding the admission day,

(viii) Discuss ethical and other humanitarian issues during unit rounds,

(ix) Attend all scheduled classes and educational activities,

(x) Document his/her observations in a prescribed log book / case record.

**(d) No learner will be given independent charge of the patient**

(e) The supervising physician will be responsible for all patient care decisions

**Assessment:**

(a) A designated faculty member in each unit will coordinate and facilitate the activities of the learner, monitor progress, provide feedback and review the 1og book case record.

(b) The log book/ case record must include the written case record prepared by the learner including relevant investigations, treatment and its rationale, hospital course, family and patient discussions, discharge summary etc.

(c) The log book should also include records of outpatients assigned. Submission of the log book/ case record to the department is required for eligibility to appear for the final examination of the subject.

# Course Content

**Human Anatomy** **First M.B.B.S. (From August 2019)**

(Based on Medical Council of India, Competency based Undergraduate curriculum for the Indian Medical Graduate, 2018. Vol. 1; page no.41-90)

## Competencies or Course Outcomes

**At the end of the First Professional Year Phase, one Student must be able to complete the study of the following competencies**

| Competency No. | Topics and Subtopics |
|---|---|
| **1** | **Anatomical Terminology** |
| AN1.1 | Anatomical position, planes, and movements in our body |
| AN1.2 | Composition of bone and bone marrow |
| | |
| **2** | **General features of Bones and Joints** |
| AN2.1 | Parts, blood and nerve supply of long bone |
| AN2.2 | Laws of ossification |
| AN2.3 | Features of sesamoid bone |
| AN2.4 | Cartilage |
| AN2.5 | Types of Joints and Examples |
| AN2.6 | Nerve supply of joints and Hilton's law |
| | |
| **3** | **General features of Muscle** |
| AN3.1 | Classification of muscles |
| AN3.2 | Parts of skeletal muscle |
| AN3.3 | Shunt and spurt muscles |
| | |
| **4** | **General features of skin and fascia** |
| AN4.1 | Types of Skin Dermatomes in body |
| AN4.2 | Structure and function of skin |
| AN4.3 | Superficial fascia |
| AN4.4 | Deep fascia |
| AN4.5 | Principles of skin incisions |
| | |
| **5** | **General features of the cardiovascular system** |
| AN5.1 | Blood Lymph and vascular system |
| AN5.2 | Pulmonary and systemic circulation |
| AN5.3 | Arteries and Veins |
| AN5.4 | Functional Classification of Vessels |
| AN5.5 | Portal System |
| AN5.6 | Anastomoses |

| Competency No. | Topics and Subtopics |
|---|---|
| AN5.7 | Meta-arterioles, sphincters and AV anastomoses |
| AN5.8 | Thrombosis, infarction and aneurysm |
| | |
| **6** | **General Features of the lymphatic system** |
| AN6.1 | Components and functions of the Lymphatic system |
| AN6.2 | Lymph capillaries and Circulation |
| AN6.3 | Lymphoedema and tumour spread |
| **7** | **Introduction to the Nervous System** |
| AN7.1 | General plan and components of CNS, ANS, and PNS. |
| AN7.2 | Components of nervous tissue and functions |
| AN7.3 | Classifications and parts of neuron |
| AN7.4 | Typical spinal nerve |
| AN7.5 | Principles of innervation of muscles |
| AN7.6 | Loss of innervation of a muscle and applied anatomy |
| AN7.7 | Synapse - types |
| AN7.8 | Ganglia |
| | |
| **8** | **Features of individual bones (Upper Limb)** |
| AN8.1 | Bones of upper limb |
| AN8.2 | Joints formed by bones of the upper limb |
| AN8.3 | Peculiarities of clavicle |
| AN8.4 | Muscle attachments of bones |
| AN8.5 | Articulated hand |
| AN8.6 | Scaphoid fracture |
| | |
| **9** | **Pectoral region** |
| AN9.1 | Pectoralis major and pectoralis minor |
| AN9.2 | Breast |
| AN9.3 | Development of breast |
| | |
| **10** | **Axilla, Shoulder and Scapular region** |
| AN10.1 | Boundaries and Contents of the axilla |
| AN10.2 | Axillary artery and Vein |
| AN10.3 | Brachial plexus |
| AN10.4 | Axillary lymph nodes |
| AN10.5 | Variation in brachial plexus |
| AN10.6 | Erb's Palsy and Klumpke's paralysis |
| AN10.7 | Enlarged axillary lymph nodes |
| AN10.8 | Trapezius and latissimus dorsi |
| AN10.9 | Anastomosis around the scapula and triangle of auscultation |

| Competency No. | Topics and Subtopics |
|---|---|
| AN10.10 | Deltoid and rotator cuff muscles |
| AN10.11 | Serratus anterior |
| AN10.12 | Shoulder joint |
| AN10.13 | Axillary nerve injury during IM injections |
| | |
| **11** | **Arm and Cubital fossa** |
| AN11.1 | Biceps and triceps brachii |
| AN11.2 | Important nerves and vessels in the arm |
| AN11.3 | Venipuncture of cubital veins |
| AN11.4 | Saturday night palsy |
| AN11.5 | Cubital fossa |
| AN11.6 | Elbow joint anastomosis |
| | |
| **12** | **Forearm and hand** |
| AN12.1 | Muscle groups of the ventral forearm |
| AN12.2 | Nerves and vessels of the forearm |
| AN12.3 | Flexor retinaculum |
| AN12.4 | Carpal tunnel syndrome |
| AN12.5 | Muscles of hand. movements of thumb |
| AN12.6 | Movements of thumb |
| AN12.7 | Vessels and nerves in the hand |
| AN12.8 | Claw hand |
| AN12.9 | Fibrous flexor sheaths, synovial sheaths |
| AN12.10 | Infection of Fascial spaces of palm |
| AN12.11 | Muscle groups of dorsal forearm |
| AN12.12 | Nerves and vessels of the back of the forearm |
| AN12.13 | Wrist drop |
| AN12.14 | Extensor retinaculum |
| AN12.15 | Extensor expansion formation |
| | |
| **13** | **General Features, Joints, radiographs and surface marking** |
| AN13.1 | Fascia, compartments, veins and lymphatic of upper limbs |
| AN13.2 | Dermatomes of upper limbs |
| AN13.3 | Joints of the upper limb |
| | Elbow, Radio-ulnar, wrist and first carpometacarpal joint) |
| | |
| **11** | **Arm and Cubital fossa** |
| AN11.1 | Biceps and triceps brachii |

| Competency No. | Topics and Subtopics |
|---|---|
| AN11.2 | Important nerves and vessels in arm |
| AN11.3 | Venipuncture of cubital veins |
| AN11.4 | Saturday night palsy |
| AN11.5 | Cubital fossa |
| AN11.6 | Elbow joint anastomosis |
| | |
| **12** | **Forearm and hand** |
| AN12.1 | Muscle groups of ventral forearm |
| AN12.2 | Nerves and vessels of the forearm |
| AN12.3 | Flexor retinaculum |
| AN12.4 | Carpal tunnel syndrome |
| AN12.5 | Muscles of hand. movements of thumb |
| AN12.6 | Movements of thumb |
| AN12.7 | Vessels and nerves in the hand |
| AN12.8 | Claw hand |
| AN12.9 | Fibrous flexor sheaths, synovial sheaths |
| AN12.10 | Infection of Fascial spaces of palm |
| AN12.11 | Muscle groups of dorsal forearm |
| AN12.12 | Nerves and vessels of the back of the forearm |
| AN12.13 | Wrist drop |
| AN12.14 | Extensor retinaculum |
| AN12.15 | Extensor expansion formation |
| | |
| **13** | **General Features, Joints, Radiographs and Surface Marking** |
| AN13.1 | Fascia, compartments, veins and lymphatic of upper limbs |
| AN13.2 | Dermatomes of upper limbs |
| AN13.3 | Joints of the upper limb: Elbow, Radio-ulnar, wrist and first carpometacarpal joint) |
| AN13.4 | Joints of the upper limb: Sternoclavicular, Acromioclavicular, Carpometacarpal joints and Metacarpophalangeal joints |
| AN13.5 | Radiographs of UL |
| AN13.6 | Bony landmarks of UL |
| AN13.7 | Surface projection of vessels, testing of muscle |
| AN13.8 | Development of UL |
| | |
| **14** | **Features of individual bones (Lower Limb)** |
| AN14.1 | Features of given bones |
| AN14.2 | Joints formed by given bone |
| AN14.3 | Importance of ossification of the femur and the tibia |
| AN14.4 | Articulated foot |
| | |

| Competency No. | Topics and Subtopics |
|---|---|
| **15** | **Front and Medial side the of thigh** |
| AN15.1 | Nerves and vessels of the thigh |
| AN15.2 | Major Muscles |
| AN15.3 | Femoral triangle |
| AN15.4 | Psoas abscess and Femoral hernia |
| AN15.5 | Adductor canal |
| | |
| **16** | **The Gluteal region and back of the thigh** |
| AN16.1 | Nerves and vessels |
| AN16.2 | Sciatic nerve injury |
| AN16.3 | Trendelenburg sign |
| AN16.4 | Hamstrings muscle |
| AN16.5 | Nerve and vessels of the back of the thigh |
| AN16.6 | Popliteal fossa |
| | |
| **17** | **The Hip Joint** |
| AN17.1 | Gross anatomy of the hip joint |
| AN17.2 | Fracture of neck of femur |
| AN17.3 | Dislocation |
| | |
| **18** | **Knee joint, Anterolateral compartment the of leg and dorsum of the foot** |
| AN18.1 | Major muscles |
| AN18.2 | Nerves and vessels |
| AN18.3 | Foot drop |
| AN18.4 | Knee joint |
| AN18.5 | Locking and unlocking |
| AN18.6 | Knee joint injuries with its applied anatomy |
| AN18.7 | Osteoarthritis |
| | |
| **19** | **Back of leg and sole** |
| AN19.1 | Major muscles |
| AN19.2 | Nerves and Vessels |
| AN19.3 | Peripheral heart |
| AN19.4 | Rupture of calcaneal tendon |
| AN19.5 | Arches of foot |
| AN19.6 | Flat and club foot |
| AN19.7 | Metatarsalgia and plantar fasciitis |
| | |
| **20** | **General Features, joints, radiographs and surface marking** |
| AN20.1 | Tibiofibular and ankle joint |

| Competency No. | Topics and Subtopics |
|---|---|
| AN20.2 | Subtalar and transverse tarsal joints |
| AN20.3 | Fascia, venous drainage, lymphatic Retinacula and dermatomes of Lower limb |
| AN20.4 | Enlarged inguinal lymph nodes |
| AN20.5 | Varicose veins and deep vein thrombosis |
| AN20.6 | Radiographs of lower limb |
| AN20.7 | Bony landmarks |
| AN20.8 | Vessels of lower limb palpation |
| AN20.9 | Surface projection nerves and veins |
| AN20.10 | Development of lower limb |
| | |
| **21** | **Thoracic Sage** |
| AN21.1 | Sternum, Typical Rib, first Rib and typical thoracic vertebra |
| AN21.2 | A typical Ribs and vertebra |
| AN21.3 | Thoracic inlet, cavity, and outlet |
| AN21.4 | Intercostal muscles |
| AN21.5 | Typical intercostal nerve |
| AN21.6 | Intercostal vessels |
| AN21.7 | A typical intercostal nerve subcostal artery, superior Artery |
| AN21.8 | Joints of thorax |
| AN21.9 | Mechanics of respiration |
| AN21.10 | Costochondral and interchondral joints |
| AN21.11 | Mediastinum |
| | |
| **22** | **Heart and Pericardium** |
| AN22.1 | Pericardium |
| AN22.2 | Each chamber of the heart |
| AN22.3 | Coronary arteries |
| AN22.4 | Ischemic heart disease |
| AN22.5 | Coronary sinus |
| AN22.6 | The fibrous skeleton of the heart |
| AN22.7 | Conducting system of the heart |
| | |
| **23** | **Mediastinum** |
| AN23.1 | Oesophagus |
| AN23.2 | Thoracic duct |
| AN23.3 | Superior Vena Cava, Azygos, hemi azygous and accessory hemi azygous veins |
| AN23.4 | Arch of the aorta and descending aorta |
| AN23.5 | Thoracic sympathetic chain |
| AN23.6 | Splanchnic nerves |

| Competency No. | Topics and Subtopics |
|---|---|
| AN23.7 | Lymphatic duct |
| | |
| **24** | **Lungs and Trachea** |
| AN24.1 | Pleura, Pleural, recess and applied anatomy |
| AN24.2 | Root of lung and bronchial tree |
| AN24.3 | Broncho pulmonary segment |
| AN24.4 | Phrenic nerve |
| AN24.5 | Blood Supply nerve supply Lymphatic drainage of Lungs |
| AN24.6 | Trachea |
| | |
| **25** | **Thorax** |
| AN25.1 | Draw and label microanatomy of trachea and lung |
| AN25.2 | Development of pleura, lung and heart |
| AN25.3 | Foetal circulation |
| AN25.4 | Atrial septal defect, Ventricular septal defect, Fallot's tetralogy and Tracheo-oesophageal fistula |
| AN25.5 | Transposition of great vessels, Dextrocardia, Patent Ductus Arteriosus and Coarctation of aorta |
| AN25.6 | Development of aortic arch arteries, SVC, IVC and coronary Sinus. |
| AN25.7 | Chest Radiograph AP and Lateral view |
| AN25.8 | Barium swallow |
| AN25.9 | Surface projection of pleura heart lungs |
| | |
| **26** | **Skull Osteology** |
| AN26.1 | Anatomy of skull bones |
| AN26.2 | Skull Norma |
| AN26.3 | Interior of skull |
| AN26.4 | Mandible |
| AN26.5 | Typical and Atypical cervical vertebrae (Atlas and axis) |
| AN26.6 | Bones that ossify in the membrane |
| AN26.7 | 7th cervical vertebra |
| | |
| **27** | **Scalp** |
| AN27.1 | Scalp, Blood supply, Nerve supply, Layers and Surgical importance |
| AN27.2 | Emissary's veins |
| | |
| **28** | **Face and Parotid region** |
| AN28.1 | Facial muscles |
| AN28.2 | Nerve supply of facial muscles |
| AN28.3 | Facial vessels |
| AN28.4 | Facial Nerve |
| AN28.5 | Cervical Lymph node |

| Competency No. | Topics and Subtopics |
|---|---|
| AN28.6 | Superficial muscles of the face |
| AN28.7 | Facial Nerve Palsy |
| AN28.8 | Deep facial vein |
| AN28.9 | Parotid gland |
| AN28.10 | Frey's syndrome Can be covered with 28.3 |
| | |
| **29** | **Posterior triangle of neck** |
| AN29.1 | Sternocleidomastoid |
| AN29.2 | Erb's and Klumpke's palsy |
| AN29.3 | wry neck |
| AN29.4 | Omohyoid, Scalenae and Levator scapulae |
| | |
| **30** | **Cranial cavity** |
| AN30.1 | Cranial fossa |
| AN30.2 | Foramina |
| AN30.3 | Dural venous sinuses |
| AN30.4 | Cavernous sinuses |
| AN30.5 | Visual Pathways |
| | |
| **31** | **Orbit** |
| AN31.1 | Extra ocular muscles |
| AN31.2 | Nerves and vessels in the orbit |
| AN31.3 | Horner's syndrome |
| AN31.4 | Lacrimal apparatus |
| AN31.5 | 3rd, 4th and 6th Cranial Nerves |
| | |
| **32** | **Anterior Triangle** |
| AN32.1 | Anterior triangle |
| AN32.2 | Carotid, muscular, digastric, and submental triangles |
| | |
| **33** | **Temporal and Infratemporal regions** |
| AN33.1 | Temporal and infratemporal fossae |
| AN33.2 | Muscle of mastication |
| AN33.3 | Temporomandibular joint |
| AN33.4 | Pterygoid venous plexus |
| AN33.5 | Dislocation with Temporomandibular joint |
| | |
| **34** | **Submandibular region** |
| AN34.1 | Submandibular Salivary Gland and Ganglion |
| AN34.2 | Submandibular stones |
| | |

| Competency No. | Topics and Subtopics |
|---|---|
| **35** | **Deep Structures in the neck** |
| AN35.1 | Deep Cervical Fascia |
| AN35.2 | Thyroid gland |
| AN35.3 | Subclavian Artery |
| AN35.4 | internal jugular and Brachiocephalic vein |
| AN35.5 | Cervical lymph nodes |
| AN35.6 | Cervical Sympathetic chain |
| AN35.7 | IX, X, XI, and XII, Cranial nerve |
| AN35.8 | Thyroid Swellings |
| AN35.9 | Clinical features of compression by Cervical rib |
| AN35.10 | Fascial Spaces of the neck |
| | |
| **36** | **Mouth, pharynx and palate** |
| AN36.1 | Soft palate, Palatine tonsil |
| AN36.2 | Waldeyer's Lymphatic Ring |
| AN36.3 | Pyriform fossa and Applied |
| AN36.4 | Tonsils and Adenoids with applied anatomy |
| AN36.5 | Clinical significance of Kilian's dehiscence |
| | |
| **37** | **Cavity of Nose** |
| AN37.1 | Nasal septum, lateral wall of Nose, |
| AN37.2 | Paranasal sinuses |
| AN37.3 | Maxillary sinus –Applied Anatomy |
| | |
| **38** | **Larynx** |
| AN38.1 | Intrinsic and Extrinsic muscles of larynx |
| AN38.2 | Anatomical aspects of laryngitis |
| AN38.3 | Recurrent laryngeal nerve Injury |
| | |
| **39** | **Tongue** |
| AN39.1 | Tongue |
| AN39.2 | XII Cranial hypoglossal Applied Anatomy |
| | |
| **40** | **Organs of hearing and equilibrium** |
| AN40.1 | External ear |
| AN40.2 | Middle ear |
| AN40.3 | Internal ear |
| AN40.4 | Applied Anatomy otitis externa / media |
| AN40.5 | Myringotomy |
| | |
| **41** | **Eyeball** |

| Competency No. | Topics and Subtopics |
|---|---|
| AN41.1 | Eyeball |
| AN41.2 | Eyeball applied cataract, glaucoma and central retinal artery occlusion |
| AN41.3 | Intraocular muscles |
| | |
| **42** | **Back region** |
| AN42.1 | Vertebral canal |
| AN42.2 | Sub occipital triangle |
| AN42.3 | Semi spinalis capitis and Splenius Capitis |
| | |
| **43** | **Head and neck joints, Histology, Development, Radiography and surface marking** |
| AN43.1 | Movements with muscles producing the movements of the atlantooccipital joint and atlantoaxial joint |
| AN43.2 | Pituitary, Thyroid, parathyroid and Salivary gland tongue, Epiglottis, Cornea, Retina |
| AN43.3 | Microanatomy of olfactory epithelium, Eyelid, lip. The optic nerve, pineal gland |
| AN43.4 | Development and anomalies of face, palate, tongue, brachial apparatus pituitary gland, Thyroid, Eye |
| AN43.5 | Muscles of facial expression, extraocular muscles palpation of carotid, superficial temporal, facial arteries, location of the internal jugular and Ext. jugular veins. hyoid bone, thyroid cartilage, cricoid cartilage |
| AN43.6 | Surface anatomy thyroid, parotid gland common carotid artery, IJV, SCV, EJV, facial artery. |
| AN43.7 | X-Ray skull AP and Lat. view |
| AN43.8 | Carotid and vertebral Angiogram |
| AN43.9 | Structures in carotid and vertebral angiogram |
| | |
| **44** | **Anterior abdominal wall** |
| AN44.1 | Planes, Quadrants of the abdomen. |
| AN44.2 | Fascia, nerves and Blood supply of ant. Abdominal wall. |
| AN44.3 | Rectus sheath |
| AN44.4 | Inguinal canal |
| AN44.5 | Inguinal Hernia |
| AN44.6 | Muscles of Ant. Abdominal wall |
| AN44.7 | Common Abdominal incisions |
| | |
| **45** | **Posterior abdominal wall** |
| AN45.1 | Thoracolumbar fascia |
| AN45.2 | Lumbar plexus |
| AN45.3 | Back muscles |
| | |
| **46** | **Male external genitalia** |
| AN46.1 | Testis and its descent |
| AN46.2 | Epididymis |
| AN46.3 | Penis |

| Competency No. | Topics and Subtopics |
|---|---|
| AN46.4 | Varicocele |
| AN46.5 | Phimosis and circumcision |
| | |
| **47** | **Abdominal cavity** |
| AN47.1 | Lesser and Greater sac |
| AN47.2 | Peritoneal folds and pouches |
| AN47.3 | Ascites and peritonitis |
| AN47.4 | Subphrenic Abscess |
| AN47.5 | Major Viscera |
| AN47.6 | Accessory spleen, Kehr's sign, Vagotomy, Liver biopsy |
| AN47.7 | Calot's triangle |
| AN47.8 | Portal vein, Inferior Vena Cava, Renal vein |
| AN47.9 | Abdominal aorta, coeliac trunk |
| AN47.10 | Portosystemic Anastomosis |
| AN47.11 | Portal Hypertension |
| AN47.12 | Nerve plexus post. Abdominal wall. |
| AN47.13 | Thoraco abdominal diaphragm |
| AN47.14 | Diaphragmatic Hernia |
| | |
| **48** | **Pelvic wall and viscera** |
| AN48.1 | Muscles of the pelvic diaphragm |
| AN48.2 | Male and female pelvic viscera |
| AN48.3 | Internal iliac Artery |
| AN48.4 | Sacral plexus |
| AN48.5 | Uterine anomalies anal fistula |
| AN48.6 | Automatic bladder |
| AN48.7 | Gross Anatomy of Prostate, Benign Prostatic Hypertrophy (BPH) and prostate cancer |
| AN48.8 | P/V and P/R examination |
| | |
| **49** | **Perineum** |
| AN49.1 | Superficial and deep perineal pouches |
| AN49.2 | Perineal body |
| AN49.3 | Perineal Membrane in male and female |
| AN49.4 | Ischiorectal fossa |
| AN49.5 | Perineal tear, episiotomy perineal abscess and Anal fissure |
| | |
| **50** | **Vertebral Column** |
| AN50.1 | Curvatures of vertebral Column |
| AN50.2 | Intervertebral joint and sacroiliac joint, Pubic symphysis |
| AN50.3 | Lumbar puncture |

| Competency No. | Topics and Subtopics |
|---|---|
| AN50.4 | Scoliosis, lordosis, PID, Spina bifida, Spondylolisthesis |
| | |
| **51** | **Sectional Anatomy** |
| AN51.1 | Cross section at T8, T10, and L1 |
| AN51.2 | Midsagittal section male and female pelvis |
| | |
| **52** | **Histology and Embryology** |
| AN52.1 | Gastrointestinal Tract |
| AN52.2 | Excretory system |
| AN52.3 | Cardio-oesophageal junction, Corpus luteum |
| AN52.4 | Development of anterior abdominal wall |
| AN52.5 | Congenital anomalies of Diaphragm |
| AN52.6 | Congenital anomalies of foregut midgut hindgut |
| AN52.7 | Urinary System Development |
| AN52.8 | Reproductive system Development |
| | |
| **53** | **Osteology** |
| AN53.1 | Bone – Identification, anatomical position, articulations and attachments |
| AN53.2 | Bony pelvis |
| AN53.3 | Bones of abdominopelvic region |
| AN53.4 | Clinical importance of bones of abdominopelvic region |
| | |
| **54** | **Radio diagnosis** |
| AN54.1 | KUB plain X-ray abdomen |
| AN54.2 | (contrast X-ray Barium swallow, Barium meal, Barium enema,) Cholecystography, intravenous pyelography and Hysterosalpingography |
| AN54.3 | ERCP, CT abdomen, MRI Arteriography in radio diagnosis of abdomen |
| | |
| **55** | **Surface marking** |
| AN55.1 | Surface projections of regions and planes of the abdomen, superficial inguinal ring, deep inguinal ring, McBurney's point, renal angle and Murphy's point |
| AN55.2 | Surface marking of the stomach, Liver, Fundus of the gall bladder, Spleen, Duodenum, Pancreas, ileocaecal junction, Kidneys and Root of the mesentery |
| | |
| **56** | **Meninges and CSF** |
| AN56.1 | Various layers of meninges with their extent and modifications |
| AN56.2 | Formation and circulation of CSF with its applied anatomy |
| | |
| **57** | **Spinal Cord** |
| AN57.1 | External features of the spinal cord |
| AN57.2 | The extent of the spinal cord in children and adults with its clinical implication |
| AN57.3 | Transverse section of the spinal cord at the mid-cervical and midthoracic level |
| AN57.4 | Ascending and descending tracts at the mid-thoracic level of the spinal cord |

| Competency No. | Topics and Subtopics |
|---|---|
| AN57.5 | Describe the anatomical basis of syringomyelia |
| | |
| **58** | **Medulla Oblongata** |
| AN58.1 | External features of the medulla oblongata |
| AN58.2 | Transverse section of the medulla oblongata at the level of 1) pyramidal decussation 2) sensory decussation 3) Inferior Olivary Nucleus |
| AN58.3 | Cranial nerve nuclei in medulla oblongata with their functional group |
| AN58.4 | Anatomical basis and effects of medial and lateral medullary Syndrome |
| | |
| **59** | **Pons** |
| AN59.1 | External features of the Pons |
| AN59.2 | Transverse section of pons at the upper and lower level |
| AN59.3 | Cranial nerve nuclei in pons with their functional group |
| | |
| **60** | **Cerebellum** |
| AN60.1 | External and internal features of the cerebellum |
| AN60.2 | Connections of cerebellar cortex and intracerebellar nuclei |
| AN60.3 | Anatomical basis of cerebellar dysfunction |
| | |
| **61** | **Midbrain** |
| AN61.1 | External and Internal features of the midbrain |
| AN61.2 | Internal features of the midbrain at the level of superior and inferior colliculus |
| AN61.3 | Anatomical basis and effects of Benedikt's and Weber's syndrome |
| | |
| **62** | **Cranial nerve nuclei and cerebral hemispheres** |
| AN62.1 | Cranial nerve nuclei with its functional component |
| AN62.2 | Surfaces, sulci, gyri, poles and functional areas of the cerebral hemisphere |
| AN62.3 | The white matter of the cerebrum |
| AN62.4 | Parts and major connections of basal ganglia and limbic lobe |
| AN62.5 | Boundaries, parts, gross relation, major nuclei, and connections of dorsal thalamus, hypothalamus, epithalamus, metathalamus, and subthalamus |
| AN62.6 | Formation, branches and major areas of distribution of the circle of Willis |
| | |
| **63** | **Ventricular System** |
| AN63.1 | Parts, boundaries and features of $3^{rd}$, $4^{th}$ and lateral ventricle |
| AN63.2 | Describe the anatomical basis of congenital hydrocephalus |
| | |
| **64** | **Histology and Embryology** |
| AN64.1 | Microanatomical features of the spinal cord, cerebellum and cerebrum |
| AN64.2 | Development of neural tube, spinal cord, medulla oblongata, pons, midbrain, cerebral hemisphere and cerebellum |
| AN64.3 | Various types of open neural tube defects with their embryological basis |
| | |
| **65** | **Epithelium histology** |

| Competency No. | Topics and Subtopics |
|---|---|
| AN65.1 | Types of epithelium under the microscope and describe the various types that correlate to its function |
| AN65.2 | Ultrastructure of epithelium |
| | |
| **66** | **Connective tissue histology** |
| AN66.1 | Various types of connective tissue with functional correlation |
| AN66.2 | Ultrastructure of connective tissue |
| | |
| **67** | **Muscle histology** |
| AN67.1 | Various types of muscle under the microscope |
| AN67.2 | Classification of various types of muscle and describe the structure-function correlation of the same |
| AN67.3 | Ultrastructure of muscular tissue Nervous tissue histology |
| AN68.1 | Multipolar and unipolar neurons, ganglia, peripheral nerve |
| AN68.2 | Structure-function correlation of neuron |
| AN68.3 | Ultrastructure of nervous tissue |
| | |
| **69** | **Blood Vessels** |
| AN69.1 | Elastic and muscular blood vessels, and capillaries under the microscope |
| AN69.2 | Various types and structure-function correlation of blood vessel |
| AN69.3 | Describe the ultrastructure of blood vessels |
| | |
| **70** | **Glands and Lymphoid tissue** |
| AN70.1 | Various exocrine glands under the microscope and distinguish between serous, mucous, and mixed acini |
| AN70.2 | Identify the lymphoid tissue under the microscope and describe microanatomy of lymph, node, spleen, thymus, and tonsil and correlate the structure with function |
| | |
| **71** | **Bone and Cartilage** |
| AN71.1 | Bones under the microscope classify various types and describe the structure – Function correlation of the same |
| AN71.2 | Structure of cartilage under the microscope and describe various types and structure-function correlation of the same. |
| | |
| **72** | **Integumentary System** |
| AN72.3 | Skin and its appendages under the microscope and correlate the structure with function. |
| | |
| **73** | **Chromosomes** |
| AN73.1 | Structure of chromosomes with classification |
| AN73.2 | Technique of karyotyping with its applications |
| AN73.3 | Lyon’s hypothesis |
| | |
| **74** | **Patterns of inheritance** |
| AN74.1 | Various modes of inheritance with examples |
| AN74.2 | Pedigree charts for the various types of inheritance and give examples of diseases of each mode of inheritance |

| Competency No. | Topics and Subtopics |
|---|---|
| AN74.3 | Multifactorial inheritance with examples |
| AN74.4 | Genetic basis and clinical features of Achondroplasia, Cystic Fibrosis, Vitamin D resistant rickets, Haemophilia, Duchene's muscular dystrophy and sickle cell anaemia |
| | |
| **75** | **Principle of Genetics, Chromosomal Aberrations, and Clinical Genetics** |
| AN75.1 | Structural and numerical chromosomal aberrations |
| AN75.2 | Mosaics and chimeras with example |
| AN75.3 | Genetic basis and clinical features of Prader-Willi syndrome, Edward syndrome, and Patau syndrome |
| AN75.4 | Genetic basis of variation: polymorphism and mutation |
| AN75.5 | Principles of genetic counselling |
| | |
| **76** | **Introduction to embryology** |
| AN76.1 | Stages of human life |
| AN76.2 | Phylogeny, Ontogeny, Trimester, Viability |
| | |
| **77** | **Gametogenesis and fertilization** |
| AN77.1 | Uterine changes occurring during the menstrual cycle |
| AN77.2 | Synchrony between the ovarian and menstrual cycles |
| AN77.3 | Spermatogenesis and oogenesis along with diagrams |
| AN77.4 | Stages and consequences of fertilization |
| AN77.5 | Anatomical principles underlying contraception |
| AN77.6 | Teratogenic influences, Fertility and sterility, surrogate motherhood, social significance of "sex-ratio". |
| | |
| **78** | **Second week of development** |
| AN78.1 | Cleavage and formation of blastocyst |
| AN78.2 | Development of trophoblast |
| AN78.3 | Process of implantation and common abnormal sites of implantation |
| AN78.4 | Formation of extra–embryonic mesoderm and coelom, bilaminar disc and prochordal plate |
| AN78.5 | Abortion, decidual reaction, pregnancy test |
| | |
| **79** | **3rd to 8th week of development** |
| AN79.1 | Formation and fate of the primitive streak |
| AN79.2 | Development of trophoblast, fate of Notochord |
| AN79.3 | Process of neurulation |
| AN79.4 | Describe the development of somites and intra-embryonic coelom |
| AN79.5 | Embryological basis of congenital malformations, nucleus pulposus, sacrococcygeal teratomas, neural tube defects |
| AN79.6 | Describe the diagnosis of pregnancy in the first trimester and the role of teratogens, alpha-fetoprotein |

| Competency No. | Topics and Subtopics |
|---|---|
| | |
| **80** | **Foetal membranes** |
| AN80.1 | Formation, functions and fate of chorion; amnion; yolk sac; allantois and decidua |
| AN80.2 | Formation and structure of umbilical cord |
| AN80.3 | Formation of the placenta, its physiological functions, fetomaternal circulation and placental barrier |
| AN80.4 | Embryological basis of twinning in monozygotic and dizygotic twins |
| AN80.5 | Role of placental hormones in uterine growth and parturition |
| AN80.6 | Embryological basis of estimation of foetal age. |
| AN80.7 | Various types of umbilical cord attachments |
| | |
| **81** | **Prenatal Diagnosis** |
| AN81.1 | Various methods of prenatal diagnosis |
| AN81.2 | Indications, process and disadvantages of amniocentesis |
| AN81.3 | Indications, process and disadvantages of chorion villus biopsy |
| | |
| **82** | **Ethics in anatomy** |
| AN82.1 | Respect and follow the corrected procedure when handling cadavers and other biological tissue |

**Annexure** to The Notification regarding the internal and external examination of Rural Medical College for student admitted in 2019-20 and onwards

## Anatomy

Paper wise distribution of topics

Year: First MBBS, (Paper- I & Paper- II)

| Paper | Section | Topics |
|---|---|---|
| I | A | MCQs on all topics of the paper I |
| | B & C | Gross Anatomy of Superior extremity |
| | | General embryology |
| | | Genetics |
| | | Gross Anatomy of Head, Neck, Face |
| | | Gross Anatomy of Central Nervous System |
| | | One short answer question on AETCOM module 1.1 & 1.5 |
| | | Systemic Histology and Embryology related to topic in Paper I |
| | | Scenario based / application questions can be on any topic of the paper I |
| | | For long answer question and scenario based / application Questions, region will not be repeated |
| II | A | MCQs on all topics of the paper II |
| | B & C | General Anatomy |
| | | General Histology |
| | | Gross Anatomy of Abdomen and Pelvis |
| | | Gross Anatomy of Inferior extremity |
| | | Gross Anatomy of Thorax |
| | | Systemic Histology and Embryology related to topic n Paper II |
| | | Scenario based / application questions can be on any topic of the paper II |
| | | For long answer question and scenario based / application Questions, region will not be repeated |

**Anatomy**

Pattern of **Theory question Paper-1**

Applicable from June 2020 & onward examination

Total Marks- 100 Total Time -3 hours

| | | |
|---|---|---|
| Instructions : | 1) Put in the appropriate box below the question number once only<br>2) Use blue ball point pen only<br>3) Each question carries One mark<br>4) Students will not be allotted mark if he/she overwrite strikes or put white ink on the cross once marked. | |
| | **SECTION "A" MCQ (20 Marks)** | |
| 1. | Multiple Choice Questions ( Total 20 MCQ of One mark each) (<u>4 MCQ Should be CASE based</u>)<br>a) b) c) d) e) f) g) h) i) j)<br>k) l) m) n) o) p) q) r) s) t) | (20x1=20) |

| | | |
|---|---|---|
| | **SECTION "B" & "C"** | |
| **Instructions** | 1) Use blue /black ball point pen only.<br>2) Do not write anything on the blank portion of the question paper. If written anything such type of act will be considered as an attempt to resort to unfair means.<br>3) All questions are compulsory<br>4) The number to the right indicates full marks.<br>5) Draw diagrams wherever necessary.<br>6) Distribution of syllabus in Question Paper is only meant to cover entire syllabus within the stipulated frame. The Question paper pattern is a mere guideline Questions can be asked from any paper syllabus into any question paper Student cannot Claim that the Question is out of syllabus. As it is only for the placement sake the distribution has been done.<br>7) Use a common answer book for B & C sections. | |
| | **SECTION "B" (40 Marks)** | |
| 2. | Short Answer Questions (Any Four out of Five & two SAQs will be <u>*Clinical Application Based*</u>)<br>a) b) c) d) e) | (4x5 =20 ) |
| 3. | Long Answer Questions (Any Two out of Three)<br>a) b) c) | (2x10=20) |
| | **SECTION "C" (40 Marks)** | |
| 4. | Short answer questions ( Any Four out of Five ) ( <u>*I Should be on AETCOM module 1.1, 1.5 )*</u><br>a) b) c) d) e) | (4x5= 20 ) |
| 5. | Long Answer Questions (Any Two out of Three )<br>a) b) c) | (2x10 =20) |

**Anatomy**

First Year MBBS **Practical Mark's Structure**

Internal Assessment Examinations I & II

(Applicable for batch admitted in M.B.B.S. Course from Academic Year 2019-20 & onwards)

| **Practical** | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Seat No. | Soft Part | Micro Anatomy (5 Spots) | Micro Anatomy Slide for Discussion (1 slide) | Hard Part (Bones) | Embryology Models | Clinical Anatomy Including Genetics Charts (2 spots) | Journal/ Logbook | Radiology | Living Anatomy | Practical Total |
| | A | B | C | D | E | F | G | H | I | J |
| Max. Marks | 10 | 05 | 05 | 05 | 05 | 05 | 05 | 05 | 05 | 50 |
| | | | | | | | | | | |
| | | | | | | | | | | |

**Anatomy**

First Year MBBS **Practical Mark's Structure (Prelim)**

(Applicable for batch admitted in M.B.B.S. Course from Academic Year 2019-20 & onwards)

| | Practical | | | | | | | | Oral / Viva | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Seat No. | Soft Part | Micro Anatomy (10 Spots) | Micro Anatomy Slides for Discussion (2 slides) | Axial Skeleton | Embryology Models | Clinical Anatomy Including Genetic Charts (2 Spots) | Journal / Logbook | Total | Appendicular Skeleton | X-ray | Surface Living Anatomy | Total | PR/ Oral Total |
| | A | B | C | D | E | F | G | H | I | J | K | L | M |
| Max. Marks | 25 | 10 | 05 | 10 | 10 | 10 | 10 | 80 | 10 | 05 | 05 | 20 | 100 |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

**Anatomy**

Pattern of PIMS-DU **University Practical examination**:

(Applicable for batch admitted in M.B.B.S. Course from Academic Year 2019-20 & onwards)

| **Practical** | | | | | | | | **Oral / Viva** | | | | **Total** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Seat. No | Soft Part | Micro Anatomy (10 spots) | Micro Anatomy Slides for Discussion (2 slides) | Axial Skeleton | Embryology Models | Clinical Anatomy Including Genetic Charts (2spots) | Total | Appendicular Skeleton | Radio log y | Surface Living Anatomy | Total | PR/ Oral Total |
| | A | B | C | D | E | F | G | H | I | J | K | L |
| Max. Marks | 30 | 10 | 10 | 10 | 10 | 10 | 80 | 10 | 05 | 05 | 20 | 100 |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |

* Wherever applicable newer assessment method like OSPE/ Preclinical Examination is used.

**Internal Assessment**
**Anatomy / Physiology / Biochemistry**
Applicable w. e. f. August 2019 onwards examination for batches admitted from June 2019 onwards

| Sr. No. | I - Exam ( December ) | | | II – Exam ( March ) | | |
|---|---|---|---|---|---|---|
| | Theory | Practical (Including 05 Marks for Journal & Log Book) | Total Marks | heory | Practical ( Including 05 Marks for Journal & Log Book) | Total Marks |
| 1 | 100 | 50 | 150 | 100 | 50 | 150 |

| Sr. No. | Preliminary Examinations | | |
|---|---|---|---|
| | III – Exam ( July ) | | |
| | Theory | Practical Including 10 Marks for Journal & Log Book | Total Marks |
| 1 | 200 | 100 | 300 |

1. There will be 3 internal assessment examinations in the academic year. The structure of Preliminary examinations should be similar to the structure of University examination.
2. There will be only additional examination for absent students (due to genuine reason) after approval by the Committee Constituted for the same. It should be taken after preliminary examination and before submission of internal assessment marks to the University.
3. First internal assessment examination will be held in December, second internal assessment examination will be held in March and third internal assessment examination will be held in July.
4. Internal assessment marks for theory and practical will be converted to out of 40. Internal assessment marks, after Conversion, should be submitted to university by 7$^{th}$ of August.
5. The student must secure at least 50% marks for total marks (combined in theory and practical / clinical: not less than 40% marks in theory and practical separately) assigned for internal assessment in a particular subject in order to be eligible for appearing at the final university examination of that subject. Internal assessment marks will reflect as separate head of passing at the summative examination.
6. Remedial internal assessment examination for Non – eligible students: Student who were not eligible due to less than 50% combined or less than 40% in any theory or practical, will re appear as repeater student for Prelim exam which will be conducted before Supplementary Exam. His/her internal assessment will be calculated on the basis of this Examination marks only. Students who will not be eligible in this Examination will appear with regular batch as repeater student.
7. The internal assessment marks of the remedial examination alone shall be considered and concerted into out of 40.
8. Conversion Formula for calculation of marks in internal assessment examinations.

| | First IA | Second IA | Third IA (Prelim) | Total | Internal Assessment Marks: Conversion formula (out of 40) | Eligibility to appear for final University examination (after conversion out of 40) (40% Separately in Theory and Practical, 50% Combined ) | |
|---|---|---|---|---|---|---|---|
| Theory | 100 | 100 | 200 | 400 | Total marks obtained / 10 | 16 ( minimum ) | Total of Theory + Practical Must be 40. |
| Practical | 50 | 50 | 100 | 200 | Total marks obtained / 5 | 16 ( minimum ) | |

9. Conversion formula for calculation of marks in Remedial internal assessment examination

| | Remedial Exam ( Prelim ) | Int. Assess. Marks conversion formula ( out of 40 ) | Eligibility to appear for Supplementary Exam. ( after conversion out of 40 ) 40% Separately in Theory and Practical, 50% Combined ) | |
|---|---|---|---|---|
| Theory | 200 | Total marks obtained / 5 | 16 ( minimum ) | Total of Theory + Practical Must be 40. |
| Practical | 100 | Total marks obtained / 2.5 | 16 ( minimum ) | |

**While preparing Final Marks of Internal Assessment, the rounding off marks shall done as illustrated in following table**

| Internal Assessment Marks | Final rounded marks |
|---|---|
| 15.01 to 15.49 | 15 |
| 15.50 to 15.99 | 16 |

**Internal assessment pattern in Community Medicine:**
**Only one examination in First MBBS, at end of**
**Teaching; Theory- 50 marks and Practical- 50 marks**

**General rules regarding assessments as per GMER Gazette notification dated 4/11/2019**

**Assessment**

**11.1. Eligibility to appear for Professional examinations.**

**11.1.1. The performance** in essential components of training are to be assessed, based on:

**a) Attendance**

1. Attendance requirements are 75% in theory and 80% in practical / clinical for eligibility to Appear for the examinations in that subject. In subjects that are taught in more than one Phase – the learner must have 75% attendance in theory and 80% in practical in each phase of instruction in that subject.
2. If an examination comprises more than one subject (for e.g., General Surgery and allied Branches), the candidate must have 75% attendance in each subject and 80% attendance in each clinical posting.
3. Learners who do not have at least 75% attendance in the electives will not be eligible for The Third Professional – Part II examination.

**b) Internal Assessment:** Internal assessment shall be based on day-to-day assessment. It shall Relate to different ways in which learners participate in learning process including Assignments, preparation for seminar, clinical case presentation, preparation of clinical case For discussion, clinical case study/ problem solving exercise, participation in project for health care in the community, proficiency in carrying out a practical or a skill in small research project, a written test etc.

1. Regular periodic examinations shall be conducted throughout the course. There shall be no less than three internal assessment examinations in each Preclinical / Para-clinical subject and no less than two examinations in each clinical subject in a professional year. An end of posting clinical assessment shall be conducted for each clinical posting in each Professional year.
2. When subjects are taught in more than one phase, the internal assessment must be done in each phase and must contribute proportionately to final assessment. For example, General Medicine must be assessed in second Professional, third Professional Part I and third Professional Part II, independently.
3. Day to day records and log book (including required skill certifications) should be given importance in internal assessment. Internal assessment should be based on competencies and skills.
4. The final internal assessment in a broad clinical specialty (e.g., Surgery and allied specialties etc.) shall comprise of marks from all the constituent specialties. The proportion of the marks for each constituent specialty shall be determined be the time of instruction allotted to each.
5. Learners must secure at least 50% marks of the total marks (combined in theory and practical/ clinical; not less than 40% marks in theory and practical separately) assigned for internal assessment in a particular subject in order to be eligible for appearing at the final University examination of that subject. Internal assessment marks will reflect as separate head of passing at the summative examination.
6. The results of internal assessment should be displayed on the notice board within a 1-2 weeks of the test. Universities shall guide the colleges regarding formulating policies for remedial measures for students who are either not able to score qualifying marks or have missed on some assessments due to any reason.
7. Learners must have completed the required certifiable competencies for that phase of training and completed the log book appropriate for that phase of training to be eligible for appearing at the final university examination of that subject.

**University Examinations**

11.2.1 University examinations are to be designed with a view to ascertain whether the candidate has acquired the necessary knowledge., minimal level of skills, ethical and professional values with clear concepts of the fundamentals which are necessary for him/her to function effectively and appropriately as a physician of first contact. Assessment shall be carried out on an objective basis to the extent possible.

11.2.2 Nature of questions will include different types such as structured essays (Long Answer Questions –LAQ), Short Answers Questions (SAQ) and objective type questions (e.g. Multiple Choice Questions- MCQ). Marks for each part should be indicated separately. MCQs shall be accorded a weightage of not more than 20% of the total theory marks. In subjects that have two papers, the learner must secure at

least 40% marks in each of the papers with minimum 50% of marks in aggregate (both papers together) to pass.

11.2.3 Practical /clinical examinations will be conducted in the laboratories and /or hospital wards. The objective will be to assess proficiency and skills to conduct experiments, interpret data and form logical conclusion Clinical cases kept in the examination must be common conditions that the learner may encounter as a physician of first contact in the community. Selection of rare syndromes and disorders as examination cases is to be discouraged. Emphasis should be on candidate's capability to elicit history, demonstrate physical signs, write a case record, analyze the case and develop a management plan.

11.2.4 Viva/oral examination should assess approach to patient management, emergencies, attitudinal, ethical and professional values. Candidate's skill in interpretation of common investigative data, X-rays, identification of specimens, ECG, etc. is to be also assessed.

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

11.2.6 A learner shall not be entitled to graduate after 10 years of his/her joining of the first part of the MBBS course.

11.2.7 University Examinations shall be held as under :

**a) First Professional**

1. The first Professional examination shall be held at the end of first Professional training (1+12 months), in the subjects of Human Anatomy, Physiology and Biochemistry.
2. 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. Partial attendance at any University examination shall be counted as an availed attempt.

**b) Second Professional**

1. The second Professional examination shall be held at the end of second professional training (11 months), in the subjects of Pathology, Microbiology, and Pharmacology.

**c) Third Professional**

1. Third Professional Part I shall be held at end of third Professional part I of training (12 months) in the subjects of Ophthalmology, Otorhinolaryngology, Community Medicine and Forensic Medicine and Toxicology.
2. Third Professional Part II- ( Final Professional ) examination shall be at the end of training (14 months including 2 months of electives) in the subjects of General Medicine, General Surgery, Obstetrics & Gynecology and Pediatrics. The discipline of Orthopedics, Anesthesiology, Dentistry and Radiodiagnosis will constitute 25% of the total theory marks incorporated as a separate section in paper II of General Surgery.
3. The discipline of Psychiatry and Dermatology, Venereology and Leprosy (DVL), Respiratory Medicine including Tuberculosis will constitute 25% of the total theory marks in General Medicine incorporated as a separate section in paper II of General Medicine.

**d) Examination schedule is in Table 1.**

| Phase of Course | Written- Theory Total | Practicals /Orals /Clinicals | Pass Criteria |
|---|---|---|---|
| **First Professional** | | | |
| Human Anatomy – 2 papers | 200 | 100 | **Internal Assessment:** 50% combined in theory and Practical (not less than 40% in Each) for eligibility for appearing for University Examinations<br><br>**University Examination** Mandatory 50% marks separately in theory and practical (practical = practical/ clinical + viva ) |
| Physiology- 2 papers | 200 | 100 | |
| Biochemistry - 2 papers | 200 | 100 | |
| **Second Professional** | | | |
| Pharmacology - 2 papers | 200 | 100 | |
| Pathology - 2 papers | 200 | 100 | |
| Microbiology - 2 papers | 200 | 100 | |
| **Third Professional Part – I** | | | |
| Forensic Medicine & Toxicology- I papers | 100 | 100 | |
| Ophthalmology – I papers | 100 | 100 | |
| Otorhinolaryngology – 1 papers | 100 | 100 | |
| Community Medicine – 2 papers | 200 | 200 | |
| **Third Professional Part - II** | | | |
| General Medicine – 2 papers | 200 | 200 | |
| General Surgery – 2 papers | 200 | 200 | |
| Paediatrics – 1 papers | 100 | 100 | |
| Obstetrics & Gynaecology – 2 papers | 200 | 200 | |

**Note:** At least one question in each paper of the clinical specialties should test knowledge – competencies acquired during the professional development programme (AETCON module): Skills competencies acquired during the Professional Development programme (AETCON module) must be tested during clinical, practical and viva.

In subjects that have two papers, the learner must secure at least 40% marks in each of the papers with minimum 50% of marks in aggregate (both papers together) to pass in the said subject.

11.2.8 **Criteria for passing in a subject:** A candidate shall obtain 50% marks in University conducted examination separately in Theory and Practical (practical includes: practical/clinical and viva voce) in order to be declared as passed in that subject.

11.2.9 **Appointment of Examiners**

**(a)** Person appointed as an examiner in the particular subject must have at least four years of total teaching experience as assistant professor after obtaining postgraduate degree in the subject in a college affiliated to a recognized/ permitted medical college.

**(b)** For the Practical /Clinical examinations, there shall be at least four examiners for 100 learners, out of whom not less than 50% must be external examiners. Of the four examiners, the senior-most internal examiner will act as the Chairman and coordinator of candidates is maintained. Where candidates appearing are more than 100, two additional examiners (one external & one internal) for every additional 50 or part there candidates appearing, be appointed.

**(c)** In case of non-availability of medical teachers, approved teachers without a medical degree (engaged in the teaching of MBBS students as whole-time teachers in a recognized medical college), may be appointed examiners in their concerned subjects provided they possess requisite doctorate qualifications and four years teaching experience (as assistant professors) of MBBS students. Provided further that the 50% of the examiners (Internal & External) are from the medical qualification stream.

**(d)** External examiners may not be from the same University.

**(e)** The internal examiner in a subject shall not accept external examinership for a college from which external examiner is appointed in his/her subject.

**(f)** A University having more than one college shall have separate sets of examiners for each college, with internal examiners from the concerned college.

**(g)** External examiners shall rotate at an interval of 2 years.

**(h)** There shall be a Chairman of the Board of paper-setters who shall be an internal examiner and shall moderate the questions.

**(i)** All eligible examiners with requisite qualifications and experience can be appointed internal examiners by rotation in their subjects.

**(j)** All theory paper assessment should be done as central assessment program (CAP) of concerned university.

**(k)** Internal examiners should be appointed from same institution for unitary examination in same institution. For pooled examinations at one centre approved internal examiners from same university may be appointed.

**(l)** The grace marks up to a maximum of five marks may be awarded at the discretion of the University to a learner for clearing the examination as a whole but not for clearing a subject resulting in exemption.

**RECOMRNDED TEXT AND REFEREAL BOOKS**


1) Gray's Anatomy
2) Textbook of Anatomy by Vishram Singh Vol 1-4 (Fourth Edition)
3) B D Chaurasia's Human Anatomy 3 volumes (Ninth Edition)
4) Cunningham's manual of Practical Anatomy by Rachel Koshi 16th Edition Vol 1-3
5) Regional Anatomy by R. J. Last
6) Human Histology by Inderbir Singh
7) Atlas of Human Histology- DIFORE
8) Surgical Anatomy- McGregor
9) Histology- by Ham,
10) Human Embryology – Inderbir Singh/ Vishram Singh
11) Medical Embryology – Langman,
12) Surface Anatomy & Radiology – Halim Das,
13) General Anatomy by – B D Chaurasia / Vishram Singh
14) Text book of Neuroanatomy – Inderbir Singh/ Vishram Singh
15) Central Nervous System – Podar Bhagat
16) Clinical anatomy for medical students – Richard Snell
17) J.S.P. Lumbley at all – M.C.Q's in Anatomy
18) Text Book of General Anatomy – V. Subhadra Devi
19) Clinical Anatomy by-Neeta V Kulkarni.


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