



## MGM INSTITUTE OF HEALTH SCIENCES

(Deemed University u/s 3 of UGC Act, 1956)

Grade 'A' Accredited by NAAC

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# Syllabus for MBBS – (Second Year)

Approved as per BOM. 04/2007, dated 14.12.2007, item 4 & amended up to BOM.

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Syllabus have been categorized as 'Must know' (70%), 'Desirable to Know' (30%) and 'Nice to Know' (10%) topics.

Inside this booklet, 'Desirable to know' & 'Nice to Know' topics are stamped and remaining all unstamped topics belong to 'Must Know' area.

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## GENERAL CONSIDERATIONS AND TEACHING APPROACH

- (1) Graduate medical curriculum is oriented towards training students to undertake the responsibilities of a physician of first contact who is capable of looking after the preventive, promotive, curative & rehabilitative aspect of medicine.
- (2) With wide range of career opportunities available today, a graduate has a wide choice of career opportunities. The training, though broad based and flexible should aim to provide an educational experience of the essentials required for health care in our country.

“Training should be able to meet internationally acceptable standards.”

- (3) To undertake the responsibilities of service situations which is a changing condition and of various types, it is essential to provide adequate placement training tailored to the needs of such services as to enable the graduates to become effective instruments of implementation of those requirements. To avail of opportunities and be able to conduct professional requirements, the graduate shall endeavour to have acquired basic training in different aspects of medical care.
- (4) The importance of the community aspects of health care and of rural health care services is to be recognized. This aspect of education & training of graduates should be adequately recognized in the prescribed curriculum. Its importance has been systematically upgraded over the past years and adequate exposure to such experiences should be available throughout all the three phases of education & training. This has to be further emphasized and intensified by providing exposure to field practice areas and training during the internship period. The aim of the period of rural training during internship is to enable the fresh graduates to function efficiently under such settings.
- (5) The educational experience should emphasize health and community orientation instead of only disease and hospital orientation or being concentrated – on - curative - aspects. As such all the basic concepts of modern scientific medical education are to be adequately dealt with.
- (6) There must be enough experiences to be provided for self learning. The methods and techniques that would ensure this must become a part of teaching - learning process.
- (7) The medical graduate of modern scientific medicine shall endeavour to become capable of functioning independently in both urban and rural environment. He/she shall endeavour to give emphasis on fundamental aspects of the subjects taught and on common problems of health and disease avoiding unnecessary details of specialization.
- (8) The importance of social factors in relation to the problem of health and diseases should receive proper emphasis throughout the course and to achieve this purpose, the

educational process should also be community based than only hospital based. The importance of population control and family welfare planning should be emphasized throughout the period of training with the importance of health and development duly emphasized.

- (9) Adequate emphasis is to be placed on cultivating logical and scientific habits of thought, clarity of expression and independence of judgment, ability to collect and analyze information and to correlate them.
- (10) The educational process should be placed in a historic background as an evolving process and not merely as an acquisition of a large number of disjointed facts without a proper perspective. The history of Medicine with reference to the evolution of medical knowledge both in this country and the rest of the world should form a part of this process.
- (11) Lectures alone are generally not adequate as a method of training and are a poor means of transferring/acquiring information and even less effective at skill development and in generating the appropriate attitudes. Every effort should be made to encourage the use of active methods related to demonstration and on firsthand experience. Students will be encouraged to learn in small groups, through peer interactions so as to gain maximal experience through contacts with patients and the communities in which they live. While the curriculum objectives often refer to areas of knowledge or science, they are best taught in a setting of clinical relevance and hands on experience for students who assimilate and make this knowledge a part of their own working skills.
- (12) The graduate medical education in clinical subjects should be based primarily on out-patient teaching, emergency departments and within the community including peripheral health care institutions. The out-patient departments should be suitably planned to provide training to graduates in small groups.
- (13) Clinics should be organized in small groups of preferably not more than 10 students so that a teacher can give personal attention to each student with a view to improve his skill and competence in handling of the patients.
- (14) Proper records of the work should be maintained which will form the basis for the students' internal assessment and should be available to the inspectors at the time of inspection of the college by the Medical Council of India.
- (15) Maximal efforts have to be made to encourage integrated teaching between traditional subject areas using a problem based learning approach starting with clinical or community cases and exploring the relevance of various preclinical disciplines in both understanding and resolution of the problem. Every attempt be made to de-emphasize compartmentalization of disciplines so as to achieve both horizontal and vertical integration in different phases.



- (16) Every attempt is to be made to encourage students to participate in group discussions and seminars to enable them to develop personality, character, expression and other faculties which are necessary for a medical graduate to function either in solo practice or as a team leader when he begins his independent career. A discussion group should not have more than 20 students.
- (17) Faculty member should avail of modern educational technology while teaching the students and to attain this objective, Medical Education Units/ Departments be established in all medical colleges for faculty development and providing learning resource material to teachers.
- (18) To derive maximum advantage out of this revised curriculum, the vacation period to students in one calendar year should not exceed one month, during the 4 ½ years Bachelor of Medicine and Bachelor of Surgery (MBBS) Course.
- (19) In order to implement the revised curriculum in Toto, State Govts. and Institution Bodies must ensure that adequate financial and technical inputs are provided.
- (20) HISTORY OF MEDICINE –The students will be given an outline on “History of Medicine”. This will be taught in an integrated manner by subject specialists and will be coordinated by the Medical Education Unit of the College.
- (21) All medical institutions should have curriculum committee which would plan curricula and instructional method which will be regularly updated.
- (22) Integration of ICT in learning process will be implemented.



## OBJECTIVE OF MEDICAL GRADUATE TRAINING PROGRAMME:

- (1) **NATIONAL GOALS** : At the end of undergraduate program, the medical student 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 fulfill his/her social obligations towards realization of this goal.
  - (b) Learn every aspect of National policies on health and devote himself / herself 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 observation of medical ethics and fulfilling social and professional obligations, so as to respond to national aspirations.
- (2) **INSTITUTIONAL GOALS:** (1) In consonance with the goals each medical institution should evolve institutional goals to define the manpower (or professionals) they intend to produce. The undergraduate students 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 and rehabilitative medicine in respect to the commonly encountered health problems.
  - (c) Appreciate rationale for different therapeutic modalities; be familiar with the administration of the "essential drugs" and their common side 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 Material 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) IPHS standard of health at various level of service delivery, medical waste disposal.
  - (vii) Organizational institutional arrangements.
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- (g) Acquire basic management skills in the area of human resources, materials and resource management related to health care delivery, General and hospital management, principal 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.

All efforts must be made to equip the medical graduate to acquire the skills as detailed as under:

A comprehensive list of skills recommended as desirable for Bachelor of Medicine and Bachelor of Surgery (MBBS) Graduate:

**1. Clinical Evaluation:**

- (a) To be able to take a proper and detailed history.
- (b) To perform a complete and thorough physical examination and elicit clinical signs.
- (c) To be able to properly use the stethoscope, Blood Pressure, Apparatus Auroscope, Thermometer, Nasal Speculum, Tongue Depressor, Weighing Scales, Vaginal Speculum etc.:
- (d) To be able to perform internal examination-Per Rectum (PR), Per Vaginum (PV) etc.
- (e) To arrive at a proper provisional clinical diagnosis.

**II. Bed side Diagnostic Tests:**

- (a) To do and interpret Haemoglobin (HB), Total Count (TC), Erythrocytic Sedimentation Rate (ESR), Blood smear for parasites, Urine examination /albumin /sugar /ketones /microscopic:
- (b) Stool exam for ova and cysts;
- (c) Gram, staining and Siehl-Nielsen staining for AFB;
- (d) To do skin smear for lepra bacilli
- (e) To do and examine a wet film vaginal smear for Trichomonas
- (f) To do a skin scraping and Potassium Hydroxide (KOH) stain for fungus infections;
- (g) To perform and read Montoux Test.

**III. Ability to Carry Out Procedures:**

- (a) To conduct CPR (Cardiopulmonary resuscitation) and First aid in newborns, children and adults.
- (b) To give Subcutaneous (SC) /Intramuscular (IM) /Intravenous (IV) injections and start Intravenous (IV) infusions.
- (c) To pass a Nasogastric tube and give gastric leavage.
- (d) To administer oxygen-by masic/catheter
- (e) To administer enema
- (f) To pass a urinary catheter-male and female
- (g) To insert flatus tube
- (h) To do pleural tap, Ascitic tap & lumbar puncture
- (i) Insert intercostal tube to relieve tension pneumothorax
- (j) To control external Haemorrhage.

**IV Anaesthetic Procedure**

- (a) Administer local anaesthesia and nerve block



- (b) Be able to secure airway potency, administer Oxygen by Ambu bag.
- V **Surgical Procedures**

- (a) To apply splints, bandages and Plaster of Paris (POP) slabs;
- (b) To do incision and drainage of abscesses;
- (c) To perform the management and suturing of superficial wounds;
- (d) To carry on minor surgical procedures, e.g. excision of small cysts and nodules, circumcision, reduction of paraphimosis, debridement of wounds etc
- (e) To perform vasectomy;
- (f) To manage anal fissures and give injection for piles.

VI **Mechanical Procedures**

- (a) To perform thorough antenatal examination and identify high risk pregnancies.
- (b) To conduct a normal delivery;
- (c) To apply low forceps and perform and suture episiotomies;
- (d) To insert and remove IUD's and to perform tubectomy

VII **Paediatrics**

- (a) To assess new borns and recognize abnormalities and I.U. retardation
- (b) To perform Immunization;
- (c) To teach infant feeding to mothers;
- (d) To monitor growth by the use of 'road to health chart' and to recognize development retardation;
- (e) To assess dehydration and prepare and administer Oral Rehydration Therapy (ORT)
- (f) To recognize ARI clinically;

VIII **ENT Procedures:**

- (a) To be able to remove foreign bodies;
- (b) To perform nasal packing for epistaxis;
- (c) To perform trachesotomy

IX **Ophthalmic Procedures:**

- (a) To invert eye-lids;
- (b) To give Subconjunctival injection;
- (c) To perform appellation of eye-lashes;
- (d) To measure the refractive error and advise correctional glasses;
- (e) To perform nasolacrimal duct syringing for potency

X. **Dental Procedures:**

To perform dental extraction

**XI Community Health:**

- (a) To be able to supervise and motivate, community and para-professionals for corporate efforts for the health care;
- (b) To be able to carry on managerial responsibilities, e.g. Management of stores, indenting and stock keeping and accounting
- (c) Planning and management of health camps;
- (d) Implementation of national health programmes;
- (e) To effect proper sanitation measures in the community, e.g. disposal of infected garbage, chlorination of drinking water;
- (f) To identify and institute and institute control measures for epidemics including its proper data collecting and reporting.

**XII Forensic Medicine Including Toxicology**

- (a) To be able to carry on proper medico legal examination and documentation of injury and age reports.
- (b) To be able to conduct examination for sexual offences and intoxication;
- (c) To be able to preserve relevant ancillary material for medico legal examination;
- (d) To be able to identify important post-mortem findings in common un-natural deaths.

**XIII Management of Emergency**

- (a) To manage acute anaphylactic shock;
- (b) To manage peripheral vascular failure and shock;
- (c) To manage acute pulmonary oedema and LVF;
- (d) Emergency management of drowning, poisoning and seizures
- (e) Emergency management of bronchial asthma and status asthmaticus;
- (f) Emergency management of hyperpyrexia;
- (g) Emergency management of comatose patients regarding airways, positioning prevention of aspiration and injuries
- (h) Assess and administer emergency management of burns

**Syllabus for  
PATHOLOGY**



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## **BROAD CURRICULUM AS PER MCI GUIDELINES (PATHOLOGY):**

### **i) GOAL**

The broad goal of the teaching of undergraduate student in Pathology is to provide the students with a comprehensive knowledge of the mechanisms and causes of disease, in order to enable him/her to achieve complete understanding of the natural history and clinical manifestations of disease.

### **ii) OBJECTIVES**

#### **a) KNOWLEDGE**

At the end of the course, the student should be able to:-

- (1) Describe the structure and ultra structure of a sick cell, mechanisms of cell degeneration, cell death and repair and be able to correlate structural and functional alterations.
- (2) Explain the path physiological processes which govern the maintenance of homeostasis, mechanisms of their disturbance and the morphological and clinical manifestations associated with it.
- (3) Describe the mechanisms and patterns to tissue response to injury such that she/he can appreciate the path physiology of disease processes and their clinical manifestations.
- (4) Correlate normal and altered morphology (gross and microscopic) of different organ systems in common diseases to the extent needed for understanding of disease processes and their clinical significance.

#### **b) SKILLS**

At the end of the course, the student should be able to: -

1. Describe the rationale and principles of technical procedures of the diagnostic laboratory tests and interpretation of the results;
2. Perform the simple bed-side tests on blood, urine and other biological fluid samples;
3. Draw a rational scheme of investigations aimed at diagnosing and managing the cases of common disorders;  
Understand biochemical/physiological disturbances that occur as a result of disease in collaboration with pre clinical departments.

### **iii) INTEGRATION**

At the end of training he/she should be able to integrate the causes of disease and relationship of different etiological factors (social, economic and environmental) that contribute to the natural history of diseases most prevalent in India.

# PATHOLOGY

## I. Learning Objectives

At the end of the course, the Student shall be able to,

1. Understand and describe the structure & ultra structure of a cell, the concept of cell injury, cell death, repair and the change produces thereby, in different tissues and organs.
2. Know the principles of collection, handling, storage, and dispatch of clinical samples from patient, in a proper manner.
3. Perform and interpret in a proper manner the basic clinico-pathological procedures.
4. Knowledge of the common hematological disorders and the investigations necessary to diagnose them and determine their prognosis.
5. Understand normal haemostatic mechanism, the derangements of this mechanism and the effect on human system.
6. Understand the etiopathogenesis, the pathological effects, and the clinico-pathological correlation of common infectious and non-infectious diseases.
7. Understand the concept of neoplasia with respect to etiology, gross and microscopic features, diagnosis and prognosis in different tissues and organs of the body.
8. Correlate normal and altered morphology (gross and microscopy) of different organ systems in different diseases to the extent needed of understanding of the disease processes and their clinical significance.
9. Have knowledge of common immunological disorders and their effects on human body.



**II. Total number of teaching hours: 300hrs (IIIrd, IVth & Vth Semester)**

a) Theory ( lectures & tutorials )	160 hrs
b) Practicals	110 hrs
c)Revisions & Evaluations (internal)	30 hrs
<b>Total</b>	<b>300hrs</b>

**III. Distribution of teaching hours:**

1) General Pathology	36hrs
2) Hematology	16hrs
3) Systemic Pathology	57hrs
4) Clinical Pathology	03hrs
6) Autopsy	01hrs
5) Tutorials	47hrs
<b>Total</b>	<b>160hrs</b>

	Course Contents	Hrs	Must Know	Desirable to know	Nice to know
<b>General Pathology</b>					
<b>1</b>	<b>Cell injury</b>	<b>6hrs</b>			
	Common definitions in pathology and causes of cell injury.	1hr	√		
	Modes of cell injury: Mechanisms of cell injury	1hr	√		
	Reversible cell injury: Definitions, cellular swelling, fatty change.	1hr	√		
	Irreversible cell injury: Definition Necrosis & gangrene: definitions & types. Apoptosis & its relevance.	1hr	√		√
	Intracellular accumulations & alterations: Types of Intracellular accumulations with alterations in cell organelles & cytoskeleton.	1hr	√		
	Cellular adaptations & growth disturbances: Hypertrophy, Hyperplasia, Metaplasia, Agenesis, dysplasia.	1hr	√		
	Cellular ageing and mechanism				√
<b>2</b>	<b>Acute &amp; chronic Inflammation</b>	<b>3hrs</b>			
	Acute inflammation: Define & describe cellular & vascular changes. Outcomes & morphological patterns of acute inflammation.	1hr	√		
	Chemical mediators of inflammation: definition, classification, description of each type, role in acute & chronic inflammation.	1hr	√		
	Chronic inflammation: definition & causes.	1hr	√		
	Granulomatous inflammation: etiology, pattern & systemic effects of granulomas.				
<b>3</b>	<b>Regeneration &amp; repair</b>	<b>3hrs</b>			
	Regeneration & repair: define & describe mechanism of regeneration & repair.	1hr	√		
	Healing by primary & secondary intention with local & systemic factors affecting wound healing.	1hr	√		
	Repair in specialized tissue: Describe repair in fractures & parenchymal organs.	1hr	√		
	Stem cell concept-Regenerative medicine				√

4	<b>Circulatory disturbances</b>	<b>5hrs</b>			
	Hyperemia & congestion	1hr	√		
	Edema: Define, classify, pathogenesis & correlate morphology with clinical significance.	1hr	√		
	Thrombosis: Definition, etiopathogenesis, morphology, fate & effects of thrombosis.	1hr	√		
	Embolism & Infarction: Define types with clinical significance.	1hr	√		
5	<b>Shock: Define, classify, pathogenesis, mediators &amp; stages of shock.</b>	1hr	√		
	<b>Genetic disorders</b>	<b>1hr</b>			
	Normal karyotype, classification of genetic disorders, types of genetic change.	1hr	√		
	Down's syndrome (Trisomy 21), Klinefelter's syndrome & Turner's syndrome.		√		
	Glycogen storage disease & lysosomal storage disorders.			√	
6	<b>Disturbances of pigment metabolism</b>	<b>1hr</b>			
	Types, changes associated with common disturbances like lipofuscin, Hemosiderin, melanin & Bilirubin.	1hr	√		
7	<b>Disturbances of Mineral metabolism</b>	<b>1hr</b>			
	Types & morphological changes in calcification.	1hr	√		
	Disturbance of mineral like zinc			√	
8	<b>Diseases of Immunity</b>	<b>4hrs</b>			
	Hypersensitivity reactions: Types & differentiate between different types of hypersensitivity reactions.	1hr	√		
	Transplant rejections			√	
	Autoimmune diseases: Mechanism of autoimmunity, common autoimmune diseases, SLE.	1hr	√		
	Amyloidosis: Definition, physical & chemical nature of amyloid, classification, pathogenesis, morphology, lab diagnosis with special stain & clinical correlation.	1hr	√		



	AIDS: Epidemiology, etiology, pathogenesis, morphology, clinical features, diagnosis & handling of infected materials & health education.	1hr	√		
9	<b>Infectious disease</b>	7hrs			
	<b>Typhoid fever:</b> Pathogenesis, morphology & clinical features.	1hr	√		
	<b>Syphilis:</b> Classify various stages, pathogenesis & morphology.	1hr	√		
	<b>Tuberculosis:</b> Epidemiology, etiology, pathogenesis, morphology, clinical features, lab diagnosis & importance of tuberculosis in the present day context.	2hr	√		
	<b>Leprosy:</b> Classify, pathogenesis, differentiate between different types of leprosy, histological features & sequelae.	1hr	√		
	<b>Fungal:</b> Classification of fungal diseases & opportunistic fungal infections.	1hr	√		
	<b>Parasitic:</b> Malaria: Types, morphological features in P. Vivax & Falciparum Malaria & lab diagnosis.	1hr	√		
	Leishmaniasis, Filariasis, Hydatid, Cysticercosis				√
10	<b>Neoplasia</b>	5 hrs			
	Nomenclature, classification & differentiation between benign & malignant neoplasms.	1hr	√		
	Precancerous lesions.				√
	Carcinogenesis	1hr	√		
	Tumor host interactions: Systemic effects & paraneoplastic syndromes.	1hr	√		
	Biology of tumor growth & Lab Diagnosis: Diagnostic workup including tumor markers.	1hr	√		
	Spread, grading & staging.	1hr	√		
	Molecular basis of cancer				√
	Tumor immunology				√
	11	<b>Environmental Pathology</b>	1hr		
Air pollution, Iatrogenic drug injury. Radiation & physical injury & Obesity, Tobacco & Alcoholism		1hr			√

	Course Contents	Hrs	Must Know	Desirable to know	Nice to know
1	<b>Hematopathology and transfusion medicine</b>	<b>16hrs</b>			
	Introduction to hematology & hemopoiesis	1hr	√		
	Anemia: classification and clinical features.	1hr	√		
	Nutritional anemia: Iron deficiency, Folic acid/ Vit B12 deficiency anemia including pernicious anemia.	2hr	√		
	Hemolytic anemia: Definition, classification, pathogenesis and investigations.	1hr	√		
	Hereditary spherocytosis and G6PD deficiency.			√	
	Haemoglobinopathies: Thalassemia, Sickle cell anemia.	1hr	√		
	Aplastic anemia	1hr	√		
	Hemorrhagic disorders: Classify and lab. Screening tests for hemorrhagic disorders. Platelet deficiency, ITP.	1hr		√	
	Coagulopathies: Coagulation factor deficiency, hemophilia, DIC.	1hr	√		
	Leucocytic disorders: Leucocytosis, leucopenia, Leukemoid reaction.	1hr	√		
	Acute leukemia: classification and diagnosis.	1hr	√		
	Chronic leukemia: classification and diagnosis.	1hr	√		
	Paraproteinemias: Multiple myeloma	1hr	√		
	Myelodysplastic syndromes and Myeloproliferative disorders	1hr		√	
	Blood groups and its relevance in transfusion medicine and hematology. Erythroblastosis foetalis.	1hr	√		
	Blood transfusion: Indications, selection of donor criteria, cross matching, untoward reactions, transmissible infections including HIV and hepatitis.	1hr	√		

	Course Contents	Hrs	Must Know	Desirable to know	Nice to know
	<b>Systemic Pathology</b>				
1	<b>Cardiovascular system</b>	<b>9hrs</b>			
	Hypertension & hypertensive heart disease	1hr	√		
	Atherosclerosis: Definition, etiopathogenesis, gross and microscopic features, complications and clinical correlation	1hr	√		
	Other diseases of blood vessels : Aneurysms Vasculitis	1hr	√	√	
	Ischemic heart disease: Categories and pathogenesis. Myocardial infarction : incidence, risk factors, pathogenesis, morphology, complications, clinical course and investigations	1hr	√		
	Rheumatic heart disease: Incidence, etiology, Pathogenesis, morphology, complications, clinical course & investigations.	1hr	√		
	Infective endocarditis: Causes, Pathogenesis, morphology, complications and differential diagnosis of cardiac vegetations.	1hr	√		
	Pericarditis and other pericardial diseases	1hr	√		
	Congenital heart disease: ASD, VSD, Fallot's teratology, Bicuspid aortic PDA	1hr		√	
	Cardiomyopathies	1hr		√	
2	<b>Respiratory system</b>	<b>8hrs</b>			
	<b>Pneumonias:</b> Etiopathogenesis, classifications, morphology, clinical course and complications.	1hr	√		
	<b>Lung abscess:</b> Etiopathogenesis, Morphology and complications.	1hr	√		
	Atelectasis and hyaline membrane disease.			√	
	Chronic obstructive pulmonary disease: Bronchial asthma and Bronchiectasis -Etiopathogenesis, Morphology and complications.	1hr	√		
	Chronic bronchitis and Emphysema: Etiopathogenesis, Morphology types of emphysema and complications.	1hr	√		
	Pulmonary tuberculosis: primary and secondary, morphologic types including pleuritis, clinical course.	1hr	√		



	Occupational lung disorders: Anthracosis, silicosis, asbestosis, mesothelioma.	1hr		√	
	Tumors of lung and pleura: Classification, etiopathogenesis, gross and microscopic features, pattern of spread, staging, clinical course, para-neoplastic syndromes.	1hr	√		
3	<b>Oral cavity and salivary gland</b>	<b>2hrs</b>			
	Precancerous lesions of oral cavity and oral cancers: etiopathogenesis, gross and microscopic features.	1hr	√		
	Differential diagnosis of swelling of salivary gland.	1hr	√		
4	<b>Gastrointestinal tract</b>	<b>5hrs</b>			
	Gastritis: etiology and types.	1hr		√	
	Peptic ulcer: definition, etiopathogenesis, gross and microscopic features and complications.		√		
	Ulcers of intestine: etiological classifications, morphology of typhoid, tubercular, amoebic ulcers and bacillary dysentery. Differential diagnosis of different forms of ulcers.	1hr	√		
	Idiopathic inflammatory bowel disease: etiopathogenesis, morphology and differences between Crohn's disease and ulcerative colitis.	1hr	√		
	Appendicitis		√		
	Tumors of upper Gastrointestinal Tract: Esophagus: etiopathogenesis, morphology and clinical features. Gastric carcinoma: etiopathogenesis, classification, gross and microscopic features and clinical features. Carcinoid tumors of GIT.	1hr	√		
	Tumors of lower Gastrointestinal Tract: Carcinoma colon- Etiopathogenesis, morphology and clinical features.	1hr	√	√	
	Intestinal polyps and gastrointestinal stromal tumors.			√	
5	<b>Liver and Biliary Tract</b>	<b>5hrs</b>			
	Viral hepatitis: Etiopathogenesis, types, clinical source, pathology, serologic diagnosis, sequelae.	1hr	√		
	Alcoholic liver disease: Pathogenesis, morphology and correlation with clinical features.	1hr	√		
	Cirrhosis: Etiopathogenesis, classification, pathology, complications & differential diagnosis.	1hr	√		



	Portal Hypertension: Types and manifestations.		√		
	Tumors of liver: Pathology of hepatocellular carcinoma.	1hr	√		
	Disease of gall bladder: cholecystitis, cholelithiasis and tumors.	1hr		√	
6	<b>Urinary tract system</b>	<b>8hrs</b>			
	Basics of impaired function and urinalysis	1hr	√		
	Nephritic and Nephrotic syndrome				
	Glomerulonephritis: Classification, Acute nephritis, rapidly progressive glomerulonephritis.	1hr	√		
	Renal failure: definitions, criteria, etiology, systemic manifestations and investigations.	1hr	√		
	Nephrolithiasis and obstructive nephropathy	1hr	√		
	Pyelonephritis and interstitial nephritis: etiopathogenesis of acute and chronic, morphology and clinical correlation.	1hr	√		
	Tumors of kidney and pelvis: classifications, morphology, clinical course and paraneoplastic syndromes of common tumors.	1hr	√		
	Renal vascular disorders and malformations, polycystic kidney.	1hr		√	
	Urinary bladder: cystitis and carcinoma	1hr	√		
7	<b>Female genital tract</b>	<b>6hrs</b>			
	Diseases of Uterus: Endometrial hyperplasia and carcinoma, adenomyosis, smooth muscle tumors	1hr	√		
	Trophoblastic diseases: hydatidiform mole, choriocarcinoma.	1hr		√	
	Diseases of cervix: cervicitis, cervical carcinoma, etiology cytological diagnosis	1hr	√		
	Ovarian tumors	1hr	√		
	Pelvic inflammatory disease including salpingitis	1hr	√		
	Genital tuberculosis			√	
	Breast: Non-neoplastic and Neoplastic lesions of the breast- Classification, Morphology, grading of carcinoma of breast and differential diagnosis of breast swellings.	1hr	√		

8	<b>Male Genital System</b>	<b>3hrs</b>			
	Prostate: Nodular hyperplasia, carcinoma	1hr	√		
	Testicular tumors	1hr	√		
	Carcinoma of penis	1hr	√		
9	<b>Lymphoreticular system</b>	<b>3hrs</b>			
	Diseases of spleen: Splenomegaly and effects	1hr		√	
	Lymphadenitis: Non-specific, granulomatous		√		
	Hodgkin's lymphoma, classification, morphology	1hr	√		
	Non-Hodgkin's lymphoma, classification, morphology	1hr	√		
10	<b>Dermatopathology</b>	<b>2hrs</b>			
	Skin tumors: Non-pigmented -classification and morphology.	1hr	√		
	Skin tumors: pigmented- classification and morphological features of common nevi and malignant melanoma.	1hr	√		
11	<b>Soft tissue</b>	<b>1hr</b>			
	Classification, morphological features of lipomatous, fibrous, blood vessels tumors. Neural, muscle and fibro histiocytic tumors.	1hr	√		
12	<b>Skeletal System</b>	<b>3hrs</b>			
	Osteomyelitis and Metabolic diseases: rickets / osteomalacia, osteoporosis, hyperparathyroidism	1hr		√	
	Tumors: Primary, osteosarcoma, osteoclastoma, Ewing's sarcoma, chondrosarcoma, metastatic	1hr	√		
	Arthritis: rheumatoid, osteoid and tuberculosis	1hr		√	
13	<b>Central Nervous system</b>	<b>3hrs</b>			
	CSF and its disturbances: Cerebral oedema, raised intracranial pressure	1hr	√		
	Inflammatory disorders: Pyogenic and tuberculous meningitis, brain abscess, tuberculoma.		√		
	Cerebrovascular disease: atherosclerosis, thrombosis, embolism, aneurysm, hypoxia, infarction and hemorrhage	1hr		√	
	Classify CNS tumors-primary glioma and meningioma and metastatic	1hr	√		

14	<b>Endocrine system</b>	<b>4hrs</b>			
	Thyroid: Differential diagnosis of thyroid nodule.	1hr	√		
	Adrenal diseases: Cortical hyperplasia, atrophy, tuberculosis, tumors of cortex and medulla.	1hr		√	
	Parathyroid hiperplasias and tumours , hyperparathyroidism. Pituitary tumors	1hr		√	
15	<b>Myopathies:</b> Differential diagnosis of common muscle disorders.	<b>1hr</b>		√	
	<b>Clinical Pathology</b>	<b>3hrs</b>			
1	Jaundice: Differential diagnosis and laboratory investigations in jaundice.	1hr	√		
2	Diabetes mellitus: Classification, pathogenesis of system involvement, sequelae and complications.	1hr	√		
3	Renal function tests	1hr	√		
	<b>Medical Autopsy</b>	<b>1hr</b>			
1	Indications and techniques of medical autopsies	1hr	√		

**Tutorials and Integrated teaching:**

**A Hematology**

- 1 Blood Collection and anticoagulant
- 2 Peripheral Smear
- 3 Iron deficiency Anemia
- 4 Megaloblastic Anemia
- 5 Hemolytic Anemia
- 6 Erythrocyte sedimentation Rate ( ESR) & Packed Cell Volume (PCV)
- 7 Acute Leukemia
- 8 Chronic Leukemia
- 9 Bone Marrow Examination

**B General Pathology**

- 1 Cell injury & Cell death
- 2 Intracellular accumulations
- 3 Inflammation & Repair
- 4 Circulatory Disturbances
- 5 Infections
- 6 Neoplasia
- 7 HIV/AIDS

**C Systemic Pathology**

- 1 Atherosclerosis & Ischemic heart disease
- 2 Rheumatic heart disease
- 3 Infective Endocarditis
- 4 Pneumonias



5	Tumors of Lung
6	Cirrhosis
7	Glomerulonephritis
8	Peptic Ulcer
9	Ulcers of Intestine
10	Carcinoma Breast
11	Carcinoma Cervix
12	Bone tumors
13	Museum Specimens
<b>D</b>	<b>Clinical Pathology</b>
1	Liver function test & clinical charts
2	Renal function test & clinical charts
3	Gastric function test & clinical charts
4	Cerebrospinal Fluid Examination (CSF)
5	Urine Examination

**PRACTICAL:**

1. One – third of allotted practical hours to be devoted to
  - a. Performing a complete urine examination and detecting abnormalities and correlating with pathological changes.
  - b. To perform with accuracy and reliability basic hematological estimation: TLC DLC, peripheral smear, staining, reporting along with history.
2. One third of allotted practical hours to be devoted to  
Identify and interpret gross and microscopic features of inflammatory lesions of different organs and common systemic diseases.
3. One third of allotted practical hours to be devoted to  
Discussion of case studies (paper) clinical, gross and microscopic features and other parameters wherever applicable to learn clinico-pathological correlations.

Practical Syllabus:

Clinical Pathology	
1	Introduction to Pathology
2	Blood collection and anticoagulants
3	Hemoglobin estimation
4	Total WBC count
5	Differential WBC count
6	Development of blood & bone marrow examination.
7	Laboratory investigations in anemias :
8	Acute Leukemia
9	Chronic Leukemia
10	Blood grouping
11	Urine Examination
12	Examination of CSF
13	Bleeding disorders
14	Sputum and fluid tests
15	Renal function tests
16	Liver function tests
17	Gastric & Pancreatic function tests
18	Investigations in infertility

## General and Systemic Pathology

- 1 Microscope and microscopic study of cells and tissues
- 2 Retrogressive changes
- 3 Necrosis and Gangrene
- 4 Pigments
- 5 Amyloidosis
- 6 Acute inflammation
- 7 Chronic inflammation & repair
- 8 Typhoid & syphilis
- 9 Tuberculosis and Leprosy
- 10 Circulatory disturbances I, II & III
- 11 Disorders of cell growth
- 12 Tumor Pathology I & II
- 13 Immuno Pathology I & II
- 14 Respiratory System I & II
- 15 Cardiovascular System I & II
- 16 Alimentary System I, II & III
- 17 Hepatobiliary System I & II
- 18 Diseases of Kidney I & II
- 19 Female reproductive System
- 20 Male reproductive System
- 21 Lymph nodes and Spleen
- 22 Skeletal System
- 23 Diseases of Skin
- 24 Central nervous System
- 25 Tumors of Breast and Diseases of the endocrine organs



## EXAMINATION SKILLS

- 1 Be able to collect, store and transport materials for various pathological tests including histopathology, cytopathology, clinical pathology, hematology and biochemistry.
- 2 Interpret abnormal laboratory values of common diseases
- 3 Do complete urine examination including microscopy.
- 4 Do perform and interpret hemoglobin, TLC, DLC, ESR, PCV, peripheral blood smears and red cell morphology.
- 5 Interpret the peripheral smears of common diseases.
- 6 Do blood grouping and cross matching
- 7 Adapt universal precautions for self protection against HIV and hepatitis and counsel the patient.

### Semester / Term Ending Theory and Practical Examination in Pathology

Semester	Theory Marks	Practical Marks
III	40	40
IV	40	40
V	40	40
<b>Total</b>	<b>120</b>	<b>120</b>

There will be single theory paper at the end of each semester. The pattern for theory & Practical examination will be same as **Pathology University Examination**.

#### **Pathology University Examination: Theory, Practicals and Viva**

1. Scheme of internal assessment (Pathology) : The computation of internal assessment marks shall be as per rule No 2 and 3 mentioned in this rule and regulation
2. Pattern of Theory Examination including Distribution of Marks, Questions and Time.
  - a. Distribution of Marks

Sr.No		Total marks
1	Theory ( 2 papers - 40 marks each)	80
2	Oral (Viva)	15
3	Practical	25
4	Internal assessment ( Theory -15, Practicals -15)	30
	<b>Total</b>	<b>150</b>

- i) Total duration - 4 hrs (each paper of 2 hrs or 120 minutes)
- ii) Each paper will have 3 sections.
- iii) Pattern and marking for each paper of 40 marks as provided in the table

Sections	Nature of Question- Two Theory Papers	Total No. of Questions	Mark (s) per Question	Total Marks
A)	Multiple Choice Questions (MCQs)	16	1/2	08
B)	Brief Answer Questions (BAQs)	4 out of 5	4 x 4	16
C)	Long Answer Question (LAQ)	2 out of 3	2 x 8	16
<b>Total</b>				<b>40</b>

1. Direction- Only short answer questions may be permitted from the portions marked as "Desirable to know"  
- Paper wise distribution of theory topics and number of questions:-

A) Paper I:

General Pathology inclusive of general neoplasia, Haematology inclusive of transfusion medicine.  
Out of 3 LAQs in Section C, 2 questions should be from General Pathology and General Neoplasia and one question should be from Haematology inclusive of transfusion medicine.

B) Paper II:

Systemic Pathology inclusive of Systemic Neoplasia and Clinical Pathology.  
Out of 3 LAQs in Section C, 2 questions should be from Systemic Pathology and Systemic Neoplasia and one question should be from Clinical Pathology.

4. Marking scheme: Each paper of 40 marks as shown in the above table.  
5. University examination Nature of practicals and duration (Pathology)  
a) Number of students for practical Examination should not exceed more than 35 /day

## b) Practicals

Marks 25

	Practicals		Marks
a.	10 Spots (2 minutes each)	4 specimen, 3 histopathology, 1 hematology slide, 1 instrument and 1 chart  Identification – 1/2 mark Specific short question - 1/2 mark 1 Mark for each spot	10 Marks
b.	Urine Examination	Physical Examination and two abnormal constituents.	05 Marks
c.	Histopathology slide	Draw, label and give diagnosis.	03 Marks
d.	Haematology Examination	Peripheral blood smear staining and do differential leukocyte count.	03 Marks
		Hemoglobin Estimation / Total leukocyte count / Blood group Estimation.	04 Marks
		<b>Total</b>	25 Marks

**C. Viva: Duration and topic distribution: Viva marks shall be added to theory and shall be submitted separately out of 15 Marks.**

**Viva consists of two tables; on each table the student will face 2 examiners for 5 minutes each:**

Table - I General and Systemic Pathology 7 Marks

Table - II Clinical Pathology and Haematology 8 Marks

<b>Total 15 Marks</b>
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### **TEACHING LEARNING METHODS:**

- Structured interactive sessions
- Small group discussion
- Practical including demonstrations
- Problem based exercises
- Self learning tools
- Interactive learning
- E-modules

### **LEARNING RESOURCE MATERIALS:**

- Text books
  - 1) Robbin's : Pathologic basis of Disease
  - 2) Hematology De Gruchy
  - 3) Text book of Pathology by Harsh Mohan
  - 4) Clinical Pathology: A Practical Manual by Sabitri Sanyal
- Reference books
- Practical note books
- Internet resources

### **TIME OF EVALUATION:**

There should be regular formative assessment. Formative assessment, day to day performance should be given greater importance. Examination of pathology should be at the end of 5<sup>th</sup> semester and formative assessment in middle of 3<sup>rd</sup> and 4<sup>th</sup> semester and summative assessment at the end of 5<sup>th</sup> semester.

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Resolution No. 3.2 (1)

BOM 40/2015, dated 13/03/2015, Resolution No. 3.2 (h)

ANNEXURE - 6

**MGM Medical College, Kamothe,  
Department of pathology.**

Ref: MGMPatho - July 2015-179

Date: 15/7/15

To,  
The Registrar,  
MGMIHS,  
Kamothe, Navi Mumbai.

Sub: Changes in the syllabus of Second MBBS (Para- clinical).

Respected Sir,

This is to inform you that there are no significant changes in the syllabus of second MBBS (Para-clinical) submitted to us in the subject of pathology except that the total time for theory examination will be 2hrs instead of 2hrs 30minutes [General section, A (iii)] and typing error in section B- 2 (2.2), instead of theory it should be practicals.

This is for your kind information and necessary action.

Thanking you,

Yours sincerely,

*R.Dhar*  
15.7.2015

Dr. Reeta Dhar.

Prof & HOD

Dept. of Pathology.  
Prof & Head  
Dept. of Pathology  
MGM Medical College  
Kamothe, Navi Mumbai

(Approved in BOM 40/2015, dated 13.03.2015, Resolution No. 3.2(h))

MGM Institute Of Health Sciences  
INWARD NO. 4874  
DATE: 15/7/15



**MGM INSTITUTE OF HEALTH SCIENCES**

(Deemed University u/s 3 of UGC Act, 1956)

**Grade 'A' Accredited by NAAC**

Sector-1, Kamothe, Navi Mumbai - 410209

Tel. No. 022-27432471, 022-27432994, Fax No. 022 - 27431094

E-mail : registrar@mgmuhs.com ; Website : www.mgmuhs.com

**SECOND YEAR MBBS**

**PARA-CLINICAL**

**SYLLABUS FOR THE SUBJECT OF  
SECOND YEAR MBBS COURSE  
AT CONSTITUENT COLLEGES OF  
MGM INSTITUTE OF HEALTH SCIENCES,  
NAVI MUMBAI / AURANGABAD**

*R. Dhar.*  
15.7.15

Prof & Head  
Dept. of Pathology  
G. M Medical College  
Kamothe, Navi Mumbai

**EXAMINATION PATTERN FOR PATHOLOGY, MICROBIOLOGY & PHARMACOLOGY**

**GENERAL SECTION**

**A. PASSING:-**

- i. A candidate must obtain 50% in aggregate with a minimum of 50% in Theory including oral and minimum of 50% in practical and 35% in internal assessment combined theory and practical.
- ii. Prelims examination on the basis of University pattern (Theory, Practical and viva): Minimum 3-4 weeks gap between Prelims and University examination.
- iii. The total time will be 2 hours each for theory papers of 40 marks.
- iv. Practical (total time 3 hours). The details of Practical examination exercises will be notified by Head of the department / Head of Institution.
- v. Prelim pattern will be as per the University exam with 2 papers in theory each of 2 hours duration.

**B. CALCULATION OF INTERNAL ASSESSMENT MARKS:**

- Calculation of Theory and Practical Internal Assessment marks for **Pathology, Microbiology & Pharmacology** shall be as per following rule

1. Distribution of 15 marks in theory shall be as follows:

1.1 5 marks for attendance as per the following guidelines:

Below 75% -0

Upto 75% -2.5

Above 75% proportionately higher marks at pro-rate basis (multiplication factor is 0.1)

1.2 10 marks for academic performance in theory in 2 term and prelim exam-  
(average of all the 3 internal examination shall be taken)

1.3 Marks in decimal computed in 1.1, 1.2 & 1.3 should be converted into whole number at the end.

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Prof & Head  
Dept. of Pathology  
G. M. Medical College  
Kamothe Navi Mumbai



2. Distribution of 15 marks in practical shall be as follow:

2.1 5 marks for attendance as per the following guidelines:

Below 75%- 0

Upto 75% -2.5

Above 75% proportionately higher marks at pro -rate basis (multiplication factor is 0.1)

2.2 10 marks for academic performance in Practicals in 2 term and prelim exam- (average of all the internal examination shall be taken).

2.3 Marks in decimal computed in 1.1, 1.2 & 1.3 should be converted into whole number at the end.

Minimum marks required by a candidate to be declared as pass will be as follows:

Subject	Theory and Oral		Practical		Internal assessment		Total	
	Max	Min Passing	Max	Min Passing	Max	Min. Passing	Max	Min Passing
Pathology	95	47	25	13	30	11	150	75
Microbiology	95	47	25	13	30	11	150	75
Pharmacology	95	47	25	13	30	11	150	75
FMT	50	25	30	15	20	7	100	50

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Kamotho Navi Mumbai

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Kamotho Navi Mumbai

## PATHOLOGY

University Examination: Theory, Practicals and Viva

1. Scheme of internal assessment (Pathology) : The computation of internal assessment marks shall be as per rule No 2 and 3 mentioned in this rule and regulation
2. Pattern of Theory Examination including Distribution of Marks, Questions and Time.
  - a. Distribution of Marks

Sr.No		Total marks
1	Theory ( 2 papers - 40 marks each)	80
2	Oral (Viva)	15
3	Practical	25
4	Internal assessment ( Theory -15, Practicals -15)	30
	TOTAL	150

- i) Total duration - 4 hrs (each paper of 2 hrs or 120 minutes)
- ii) Each paper will have 3 sections.
- iii) Pattern and marking for each paper of 40 marks as provided in the table

Sections	Nature of Question- Two Theory Papers	Total No. of Questions	Mark (s) per Question	Total Marks
A)	Multiple Choice Questions (MCQs)	16	1/2	08
B)	Brief Answer Questions (BAQs)	4 out of 5	4	16
C)	Long Answer Question (LAQ)	2 out of 3	8	16
<b>Total</b>				<b>40</b>

3. **Direction- Only short answer questions may be permitted from the portions marked as "Desirable to know"**  
**- Paper wise distribution of theory topics and number of questions:-**

A) **Paper 1:- General Pathology inclusive of general neoplasia, Haematology inclusive of transfusion medicine.**

Out of 3 LAQs in Section C, 2 questions should be from General Pathology and General Neoplasia and one question should be from Haematology inclusive of transfusion medicine.

B) **Paper II:-Systemic Pathology inclusive of Systemic Neoplasia and Clinical Pathology.**

Out of 3 LAQs in Section C, 2 questions should be from Systemic Pathology and Systemic Neoplasia and one question should be from Clinical Pathology.

4. **Marking scheme:-** Each paper of 40 marks as shown in the above table.

5. **University examination Nature of practicals and duration (Pathology)**

- a) Number of students for practical Examination should not exceed more than 35 /day

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A. G. M. Medical College  
Kamothe Navi Mumbai

**b) Practicals:**

**Marks 25**

- |  |                                    |
|--|------------------------------------|
| a. 10 Spots 2 minutes each (4 specimen, 1 instrument, 3 histopathology slides, 1 hematology slide and 1 chart) | 10                                 |
| Identification – 1/2 mark  | } together 1.mark for<br>each spot |
| Specific short question - 1/2 mark   |                                    |
| b. Urine Examination-physical and two abnormal constituents  | 05                                 |
| c. Histopathology slides: Diagnosis and discussion   | 03                                 |
| d. Hematology examination  |                                    |
| i). peripheral blood smear, staining and report  | 03                                 |
| ii). Hb/TLC/Blood group  | 04                                 |

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**Total 25**

**C. Viva: duration and topic distribution: Viva marks shall be added to theory and shall be submitted separately out of 15 Marks. Viva consists of two tables; on each table the student will face 2 examiners for 5 minutes each:**

Table - I General and Systemic Pathology                      7 Marks  
Table - II Clinical Pathology and Hematology                8 Marks

**Total 15 Marks**

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A. G. M. Medical College  
Kamothe, Navi Mumbai

**MGM Medical College, Kamothe,  
Department of pathology.**

Ref: MGMPatho - July 2015-180

Date: 15/7/15

To,

The Registrar,  
MGMIHS,  
Kamothe, Navi Mumbai.

Sub: Incorporation of Changes in the syllabus of Second MBBS (Para- clinical).

Respected Sir,

This is to inform you that according to resolution No. 3.2(h) required changes have been incorporated in the subject of pathology, IInd MBBS syllabus.

This is for your kind information.

Thanking you,

Yours sincerely,

*R. Dhar*  
*15.7.2015*  
Dr. Reeta Dhar.

Prof & HOD

Dept. of Pathology.

Prof & Head  
Dept. of Pathology  
MGM Medical College  
Kamothe, Navi Mumbai

**MGM Institute Of Health Sciences**  
INWARD NO. 4875  
DATE: 15/7/15  
REF: D7PA12



**SECOND YEAR MBBS  
SYLLABUS: PATHOLOGY  
2015**

# PATHOLOGY

## Learning Objectives

At the end of the course, the learned shall be able to,

1. Know the principles of collection, handling, storage, and dispatch of clinical samples from patient, in a proper manner.
2. Perform and interpret in a proper manner the basic clinico-pathological procedures.
3. Have an understanding of the common hematological disorders and the investigations necessary to diagnose them and determine their prognosis.
4. Understand the concept of cell injury, the change produces thereby, in different tissues and organs and the body capacity for healing.
5. Understand normal haemostatic mechanism, the derangements of this mechanism and the effect of human system.
6. Understand the etiopathogenesis, the pathological effects, and the clinico-pathological correlation of common infectious and non-infectious diseases.
7. Understand the concept of neoplasia with respect to etiology, gross and microscopic features, diagnosis and prognosis in different tissues and organs of the body.
8. Correlate normal and altered morphology (gross and microscopy) of different organ systems in different diseases to the extent needed of understanding of the disease processes and their clinical significance.
9. Have knowledge of common immunological disorders and their effects on human body.

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	<b>Course Contents</b>	<b>Must Know</b>	<b>Desirable to know</b>
	<b>General Pathology</b>		
<b>1.</b>	<b>Cell injury :</b> <ul style="list-style-type: none"> <li>• Common definitions in pathology and causes of cell injury.</li> <li>• Modes of cell injury: Mechanisms of cell injury</li> <li>• Reversible cell injury: Definitions, cellular swelling, fatty change.</li> <li>• Irreversible cell injury: Definition Necrosis &amp; gangrene: definitions &amp; types. Apoptosis &amp; its relevance. Differentiate necrosis &amp; apoptosis</li> <li>• Intracellular accumulations &amp; alterations: Types of Intracellular accumulations with alterations in cell organelles &amp; cytoskeleton.</li> <li>• Cellular adaptations &amp; growth disturbances: Hypertrophy, Hyperplasia, Metaplasia, Agenesis.</li> </ul>	 √ √ √ √  √  √	
<b>2.</b>	<b>Acute &amp; chronic Inflammation:</b> <ul style="list-style-type: none"> <li>• Acute inflammation: Define &amp; describe cellular &amp; vascular changes. Outcomes &amp; morphological patterns of acute inflammation.</li> <li>• Chemical mediators of inflammation: definition, classification, description of each type, role in acute &amp; chronic inflammation.</li> <li>• Chronic inflammation: definition &amp; causes. Granulomatous inflammation: etiology, pattern &amp; systemic effects of granulomas.</li> </ul>	 √  √  √	

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	<b>Course Contents</b>	<b>Must Know</b>	<b>Desirable to know</b>
3.	<b>Regeneration &amp; repair :</b> <ul style="list-style-type: none"> <li>• Regeneration &amp; repair: define &amp; describe mechanism of regeneration &amp; repair.</li> <li>• Healing by primary &amp; secondary intention with local &amp; systemic factors affecting wound healing.</li> <li>• Repair in specialized tissue: Describe repair in fractures &amp; parenchymal organs.</li> </ul>	 √  √  √	
4.	<b>Circulatory disturbances:</b> <ul style="list-style-type: none"> <li>• Edema: Define, classify, pathogenesis &amp; correlate morphology with clinical significance.</li> <li>• Hyperemia &amp; congestion</li> <li>• Thrombosis: Definition, etiopathogenesis, morphology, fate &amp; effects of thrombosis.</li> <li>• Embolism &amp; Infarction: Define types with clinical significance.</li> <li>• Shock: Define, classify, pathogenesis, mediators &amp; stages of shock.</li> </ul>	 √  √ √  √  √	
5.	<b>Genetic disorders:</b> <ul style="list-style-type: none"> <li>• Normal karyotype, classification of genetic disorders, types of genetic change.</li> <li>• Down's syndrome (Trisomy 21), Klinefelter's syndrome &amp; Turner's syndrome.</li> <li>• Glycogen storage disease &amp; lysosomal storage disorders.</li> </ul>	 √  √	   √
6.	<b>Disturbances of pigment metabolism:</b> Types, changes associated with common disturbances like lipofuscin, Hemosiderin, melanin & Bilirubin.	 √	


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	Course Contents	Must Know	Desirable to know
7.	<b>Disturbances of Mineral metabolism:</b> <ul style="list-style-type: none"> <li>Types &amp; morphological changes if calcification.</li> <li>Disturbance of mineral like zinc</li> </ul>	√	√
8.	<b>Diseases of Immunity:</b> <ul style="list-style-type: none"> <li>Hypersensitivity reactions: Types &amp; differentiate between different types of hypersensitivity reactions.</li> <li>Transplant rejections</li> <li>Autoimmune diseases: Mechanism of autoimmunity, common autoimmune diseases, SLE.</li> <li>Amyloidosis: Definition, physical &amp; chemical nature of amyloid, classification, pathogenesis, morphology, lab diagnosis with special stain &amp; clinical correlation.</li> <li>AIDS: Epidemiology, etiology, pathogenesis, morphology, clinical features, diagnosis &amp; handling of infected materials &amp; health education.</li> </ul>	√  √  √  √	√
9.	<b>Infectious disease:</b> <b>Typhoid fever:</b> Pathogenesis, morphology & clinical features. <ul style="list-style-type: none"> <li><b>Syphilis:</b> Classify various stages, pathogenesis &amp; morphology.</li> <li><b>Tuberculosis:</b> Epidemiology, etiology, pathogenesis, morphology, clinical features, lab diagnosis &amp; importance of tuberculosis in the present day context.</li> <li><b>Leprosy:</b> Classify, pathogenesis, differentiate between different types of leprosy, histological features &amp; sequelae.</li> <li><b>Fungal:</b> Classification of fungal diseases &amp; opportunistic fungal infections.</li> <li><b>Parasitic:</b> <ul style="list-style-type: none"> <li><b>Malaria:</b> Types, morphological features in P. Vivax &amp; falciparum malaria &amp; lab diagnosis.</li> </ul> </li> </ul> <b>Leishmaniasis, Filariasis, Hydatid, Cysticercosis</b>	√ √  √  √  √	√

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 Kamothe, Navi Mumbai

	<b>Course Contents</b>	<b>Must Know</b>	<b>Desirable to know</b>
<b>10.</b>	<b>Neoplasia:</b> <ul style="list-style-type: none"> <li>• Nomenclature &amp; classification. Precancerous lesions</li> <li>• Biology of tumor growth, differentiate between benign &amp; malignant neoplasms.</li> <li>• Carcinogenesis</li> <li>• Tumor host interactions: Systemic effects &amp; paraneoplastic syndromes.</li> <li>• Lab Diagnosis: Diagnostic workup including tumor markers.</li> <li>• Spread, grading &amp; staging.</li> </ul>	      	

  
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 Kamothe, Navi Mumbai

	<b>Course Contents</b>	<b>Must Know</b>	<b>Desirable to know</b>
1.	<b>Hematopathology:</b> <ul style="list-style-type: none"> <li>• Introduction to hematology &amp; hemopoiesis</li> <li>• Anemia: classification and clinical features.</li> <li>• Nutritional anemia: Iron deficiency, folic acid/ Vit B12 deficiency anemia including pernicious anemia.</li> <li>• Hemolytic anemia: classification and investigation.</li> <li>• Hereditary hemolytic anemia: thalassemia, Sickle cell anemia.</li> <li>• Hereditary spherocytosis and G6PD deficiency.</li> <li>• Acquired hemolytic anemia</li> <li>• Aplastic anemia</li> <li>• Hemorrhagic disorders: Classify hemorrhagic disorders; describe clinical distinction between purpuras &amp; coagulation disorders and lab. Screening tests.</li> <li>• Haemostatic disorders: Platelet deficiency, ITP, drug induced, secondary.</li> <li>• Coagulopathies: Coagulation factor deficiency, hemophilia, DIC and anticoagulant control.</li> <li>• Leucocytic disorders: Leucocytosis, leucopenia, Leukemoid reaction.</li> <li>• Acute and chronic leukemia: classification and diagnosis.</li> <li>• Multiple myeloma and dysproteinemias.</li> <li>• Blood transfusion: grouping and cross matching untoward reactions, transmissible infections including HIV and hepatitis.</li> <li>• Hemolytic anemias: autoimmune, alloimmune, drug induced, microangiopathic and malaria</li> <li>• Myelodysplastic syndrome</li> <li>• Myeloproliferative disorders: polycythemia, myelofibrosis.</li> </ul>	 √ √ √ √ √  √    √  √ √  √  √  √  √  √ √  √	            √ √    √   √       √     √    √  √  √

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	<b>Course Contents</b>	<b>Must Know</b>	<b>Desirable to know</b>
	<b>Systemic Pathology</b>		
<b>1</b>	<b>Cardiovascular Pathology</b> <ul style="list-style-type: none"> <li>• Rheumatic heart disease : Pathogenesis and morphology</li> <li>• Infective endocarditis: Causes and pathogenesis</li> <li>• Atherosclerosis and ischemic heart disease : myocardial infraction</li> <li>• Hypertension and hypertensive heart disease.</li> <li>• Congenital heart disease: ASD, VSD, Fallot's teratology, Bicuspid aortic PDA</li> <li>• Pericarditis</li> <li>• Cardiomyopathy</li> </ul>	<ul style="list-style-type: none"> <li>✓</li> <li>✓</li> <li>✓</li> <li>✓</li> </ul>	<ul style="list-style-type: none"> <li>✓</li> </ul>
<b>2</b>	<b>Respiratory Pathology</b> <ul style="list-style-type: none"> <li>• Inflammatory diseases of bronchi: Chronic bronchitis, bronchial asthma, Bronchiectasis</li> <li>• Pneumonias : Lobar, broncho, interstitial</li> <li>• Lung abscess: etiopathogenesis and morphology</li> <li>• Pulmonary tuberculosis: primary and secondary, morphologic types including pleuritis</li> <li>• Emphysema : type and pathogenesis</li> <li>• Tumors : Benign, malignant, Squamous cell, oat cell, adeno, etiopathogenesis</li> <li>• Structure of bronchial tree and alveolar walls, normal and altered lung function, concepts of obstructive and restrictive lung disorders</li> <li>• Nasopharyngeal and laryngeal tumors</li> <li>• Occupational lung disorders: anthracosis, silicosis, asbestosis, mesothelioma.</li> <li>• Atelectasis and hyaline membrane disease.</li> </ul>	<ul style="list-style-type: none"> <li>✓</li> <li>✓</li> <li>✓</li> <li>✓</li> <li>✓</li> <li>✓</li> <li>✓</li> </ul>	<ul style="list-style-type: none"> <li>✓</li> <li>✓</li> <li>✓</li> </ul>

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	<b>Course Contents</b>	<b>Must Know</b>	<b>Desirable to know</b>
<b>3</b>	<b>Urinary Tract pathology</b> <ul style="list-style-type: none"> <li>• Basics of impaired function and urinalysis</li> <li>• Glomerulonephritis : Classification, primary proliferative and non proliferative, secondary (SLE, polyarteritis, amyloidosis, diabetes)</li> <li>• Nephritic syndrome</li> <li>• Acute renal failure: acute tubular and cortical necrosis</li> <li>• Pyelonephritis, reflux nephropathy, interstitial nephritis</li> <li>• Renal cell tumors : renal cell carcinoma, nephroblastoma</li> <li>• Urinary bladder: cystitis, carcinoma</li> <li>• Progressive renal failure and end stage renal disease.</li> <li>• Renal vascular disorders.</li> <li>• Urinary tract tuberculosis</li> <li>• Nephrolithiasis and obstructive nephropathy</li> <li>• Renal malformation polycystic kidney.</li> </ul>	<ul style="list-style-type: none"> <li>√</li> <li>√</li> <li>√</li> <li>√</li> <li>√</li> <li>√</li> <li>√</li> <li>√</li> <li>√</li> <li>√</li> <li>√</li> <li>√</li> </ul>	<ul style="list-style-type: none"> <li></li> <li></li> <li></li> <li></li> <li></li> <li></li> <li>√</li> <li>√</li> <li>√</li> <li></li> <li>√</li> <li></li> </ul>
<b>4</b>	<b>Pathology of Gastrointestinal tract</b> <ul style="list-style-type: none"> <li>• Oral Pathology: Leukoplakia, carcinoma oral cavity and esophagus</li> <li>• Peptic ulcer: etiopathogenesis and complications, gastritis types</li> <li>• Tumors of stomach: benign, polyp, Leiomyoma, malignant adenocarcinoma, lymphoma</li> <li>• Inflammatory disease of small intestine: typhoid, tuberculosis, Crohn's disease, appendicitis.</li> <li>• Inflammatory disease of large intestine: amoebic colitis, bacillary dysentery, ulcerative colitis</li> <li>• Large and small intestine tumors: polyps, carcinoid, carcinoma, lymphoma.</li> <li>• Pancreatitis</li> <li>• Salivary gland tumors: mixed, adenoids, cystic, warthins</li> <li>• Ischemic and pseudomembranous enterocolitis, diverticulitis.</li> </ul>	<ul style="list-style-type: none"> <li>√</li> <li>√</li> <li>√</li> <li>√</li> <li>√</li> <li>√</li> <li>√</li> <li>√</li> <li>√</li> <li>√</li> <li>√</li> </ul>	<ul style="list-style-type: none"> <li></li> <li></li> <li></li> <li></li> <li></li> <li></li> <li></li> <li></li> <li>√</li> <li>√</li> <li></li> </ul>


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	<ul style="list-style-type: none"> <li>• Malabsorption-coeliac disease, tropical sprue and other causes</li> <li>• Pancreatic tumors: endocrine, exocrine and periampullary.</li> </ul>		<p>✓</p> <p>✓</p>
5	<b>Liver and Biliary tract pathology</b> <ul style="list-style-type: none"> <li>• Jaundice: Types, pathogenesis and differentiation</li> <li>• Hepatitis : acute and chronic, etiology, pathogenesis and pathology</li> <li>• Cirrhosis: etiology, classification, pathology, complications</li> <li>• Portal hypertension: types and manifestation</li> <li>• Diseases of gall bladder: Cholecystitis, cholelithiasis, carcinoma</li> <li>• Tumors of liver: hepatocellular, metastatic, tumor markers.</li> </ul>	<p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p>	
6	<b>Lymphoreticular system</b> <ul style="list-style-type: none"> <li>• Lymphadenitis: Non-specific, granulomatous</li> <li>• Hodgkin's and non-Hodgkin's lymphoma, classification, morphology</li> <li>• Diseases of spleen: splenomegaly and effects</li> </ul>	<p>✓</p> <p>✓</p> <p>✓</p>	
7	<b>Female reproductive system</b> <ul style="list-style-type: none"> <li>• Diseases of cervix: cervicitis, cervical carcinoma, etiology cytological diagnosis</li> <li>• Diseases of Uterus: Endometrial hyperplasia and carcinoma, adenomyosis, smooth muscle tumors</li> <li>• Trophoblastic diseases : hydatidiform mole, choriocarcinoma</li> <li>• Diseases of breast: Mastitis, abscess, fibrocystic disease, neoplastic lesions, fibroadenoma, carcinoma, phyllodes tumors</li> <li>• Ovarian tumors</li> <li>• Pelvic inflammatory disease including salpingitis</li> <li>• Genital tuberculosis</li> </ul> <b>Male reproductive system</b> <ul style="list-style-type: none"> <li>• Prostate: Nodular hyperplasia, carcinoma</li> <li>• Testicular tumors</li> <li>• Carcinoma of penis</li> </ul>	<p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p>	<p>✓</p> <p>✓</p>

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	<b>Course Contents</b>	<b>Must Know</b>	<b>Desirable to know</b>
<b>8</b>	<b>Osteopathology</b> <ul style="list-style-type: none"> <li>• Osteomyelitis : acute, chronic, tuberculosis</li> <li>• Metabolic diseases: rickets / osteomalacia, osteoporosis, hyperparathyroidism</li> <li>• Tumors: Primary, osteosarcoma, osteoclastoma, Ewing's sarcoma, chondrosarcoma, metastatic</li> <li>• Arthritis: rheumatoid, osteoid and tuberculosis</li> <li>• Healing of fractures</li> </ul>	 √  √  √  √  √	
<b>9</b>	<b>Endocrine pathology</b> <ul style="list-style-type: none"> <li>• Diabetes mellitus: types, pathogenesis, pathology</li> <li>• Non neoplastic lesion of thyroid : Iodine deficiency goiter, autoimmune thyroiditis, thyrotoxicosis, myxoedema</li> <li>• Tumors of thyroid : adenoma, carcinoma : papillary, follicular, medullary, anaplastic</li> <li>• Adrenal disease: Cortical hyperplasia, atrophy, tuberculosis, tumors of cortex and medulla</li> <li>• Parathyroid hyperplasia and tumors</li> </ul>	 √  √  √	   √  √
<b>10</b>	<b>Neuropathology</b> <ul style="list-style-type: none"> <li>• Inflammatory disorders: Pyogenic and tuberculous meningitis, brain abscess, tuberculoma.</li> <li>• Classify CNS tumors-primary glioma and meningioma and metastatic</li> <li>• CSF and its disturbances: Cerebral oedema, raised intracranial pressure</li> <li>• Cerebrovascular disease: atherosclerosis, thrombosis, embolism, aneurysm, hypoxia, infraction and hemorrhage</li> </ul>	 √  √  √	   √
	<b>Dermatopathology</b> <ul style="list-style-type: none"> <li>• Skin tumors: Squamous cell carcinoma, basal cell carcinoma and melanoma</li> </ul>	 √	

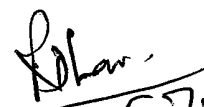
  
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## EXAMINATION SKILLS

	Skills	P. Indep	Under guidance	Assist	observe
1	Be able to collect, store and transport materials for various pathological tests including histopathology, cytopathology, clinical pathology, hematology and biochemistry.	√			
2	Interpret abnormal laboratory values of common diseases	√			
3	Do complete urine examination including microscopy.	√			
4	Do perform and interpret hemoglobin, TLC, DLC, ESR, PCV, bleeding time, clotting time, blood smears and red cell morphology.	√			
5	Interpret the peripheral smears of common disease's	√			
6	Do blood grouping and cross matching	√			
7	Adapt universal precautions for self protection against HIV and hepatitis and counsel the patient.	√			

### PRACTICAL:

1. One – third of allotted practical hours to be devoted to
  - a. Performing a complete urine examination and detecting abnormalities and correlating with pathological changes.
  - b. To perform with accuracy and reliability basic hematological estimation: TLC DLC, peripheral smear, staining, reporting along with history.
  - c. To perform basic lab hematological tests like BT & CT.
2. One third of allotted practical hours to be devoted to
  - a. Identify and interpret gross and microscopic features of acute inflammation in organs such as appendix, lungs, and meninges.
  - b. Cellular components of chronic and granulomatous inflammation.

  
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- c. Granulation tissue.
  - d. Typhoid, tuberculosis, amoebic ulcers in intestine.
  - e. Rhinosporidiosis, actinomycosis, mycetoma, molluscum contagiosum.
  - f. Amoebic liver abscess, malarial liver and spleen, filarial lymphadenitis, Cysticercosis.
  - g. Fatty liver and kidney, Amyloidosis of spleen, kidney and liver.
  - h. Types of necrosis: caseous, coagulative, liquefactive and fat.
  - i. Common systemic diseases.
3. One third of allotted practical hours to be devoted to
- a. Discussion of case studies (paper) clinical, gross and microscopic features and other parameters wherever applicable to learn clinico-pathological correlations.

#### **SUGGESTED TOPICS FOR INTEGRATED TEACHING.**

1. Immunology
2. Deficiency diseases
3. Genetics
4. Integrated seminars
  - a. Rheumatic heart disease.
  - b. Ischemic heart disease
  - c. Hypertension and hypertensive heart disease.
  - d. Tuberculosis lung.
  - e. Nephrotic syndrome
  - f. Inflammatory disease of small and large bowel
  - g. Cirrhosis
  - h. Metabolic bone disease
  - i. Diabetes mellitus
  - j. HIV/ AIDS
  - k. Iron deficiency anemia.
  - l. Jaundice
  - m. Malaria

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**TEACHING LEARNING METHODS:**

- Structured interactive sessions
- Small group discussion
- Practical including demonstrations
- Problem based exercises
- Written case scenario
- Self learning tools
- Interactive learning
- E-modules


**LEARNING RESOURCE MATERIALS:**

- Text books
- Reference books
- Practical note books
- Internet resources

**TIME OF EVALUATION:**

There should be regular formative assessment. Formative assessment, day to day performance should be given greater importance. Examination of pathology should be at the end of 5<sup>th</sup> semester and formative assessment in middle of 3<sup>rd</sup> and 4<sup>th</sup> semester and summative assessment at the end of 5<sup>th</sup> semester.

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Resolution No. 3.2(c): Resolved to accept the break-up of 25 & 15 marks in Practical & Viva examination in Microbiology, Pathology and Pharmacology in II<sup>nd</sup> MBBS. (Annexure-23)

ANNEXURE - 23



**MGM UNIVERSITY OF HEALTH SCIENCES, NAVI MUMBAI**

**MARKLIST FOR PRACTICAL AND VIVA**

CENTRE: \_\_\_\_\_

SUBJECT: PATHOLOGY

EXAM: SECOND MBBS

MONTH/YEAR: \_\_\_\_\_

**DISTRIBUTION OF PRACTICAL MARKS**

- A: 10 spots 2 minutes each (4 Specimen, 1 Instrument, 3 histopathology slides, 1 haematology slide and 1 chart)
- 1/2 marks for identification and 1/2 mark for specific short question together 1 mark for each spot.
- B: Urine Examination - 10 Marks
- C: Histopathology Slides - 05 Marks

**HAEMATOLOGY EXAMINATION**

- D: Periferal Blood smear stain & Report - 03 Marks
- E: Hb/ TLC/ Blood group - 05 Marks
- F: Total - 26 Marks

**DISTRIBUTION OF VIVA MARKS**

- G: General of Systemetic Pathology - 07 Marks
- H: Clinical Patho. & Haematology - 07 Marks
- I: Total - 14 Marks

Seat No.	A (10)	B (05)	C (03)	D (03)	E (05)	F Practical Total 26 Max. 26 Marks Min. 13 Marks	G (07)	H (07)	I Viva Total 14 Marks.
		04					8	7	15

NAME OF EXAMINER \_\_\_\_\_ COLLEGE \_\_\_\_\_ SIGNATURE WITH DATE \_\_\_\_\_

1) \_\_\_\_\_ (Convenor) \_\_\_\_\_

2) \_\_\_\_\_ (Internal) \_\_\_\_\_

3) \_\_\_\_\_ (External) \_\_\_\_\_

4) \_\_\_\_\_ (External) \_\_\_\_\_

PATHOLOGY

I. Learning Objectives

At the end of the course, the Student shall be able to,

1. Understand and describe the structure & ultra structure of a cell, the concept of cell injury, cell death, repair and the change produces thereby, in different tissues and organs.
2. Know the principles of collection, handling, storage, and dispatch of clinical samples from patient, in a proper manner.
3. Perform and interpret in a proper manner the basic clinico-pathological procedures.
4. Knowledge of the common hematological disorders and the investigations necessary to diagnose them and determine their prognosis.
5. Understand normal haemostatic mechanism, the derangements of this mechanism and the effect on human system.
6. Understand the etiopathogenesis, the pathological effects, and the clinico-pathological correlation of common infectious and non-infectious diseases.
7. Understand the concept of neoplasia with respect to etiology, gross and microscopic features, diagnosis and prognosis in different tissues and organs of the body.
8. Correlate normal and altered morphology (gross and microscopy) of different organ systems in different diseases to the extent needed of understanding of the disease processes and their clinical significance.
9. Have knowledge of common immunological disorders and their effects on human body.

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II. Total number of teaching hours: 300hrs (IIIrd, IVth & Vth Semester)

a) Theory (lectures & tutorials)	160 hrs
b) Practicals	110 hrs
c) Revisions & Evaluations (internal)	30 hrs
Total	300hrs

III. Distribution of teaching hours:

1) General Pathology	35hrs
2) Hematology	16hrs
3) Systemic Pathology	61hrs
4) Clinical Pathology	3hrs
6) Autopsy	1hr
5) Tutorials	44 hrs
Total	160hrs

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	Course Contents	Hrs	Must Know	Desirable to know
<b>General Pathology</b>				
1	<b>Cell injury</b>	<b>6hrs</b>		
	Common definitions in pathology and causes of cell injury.	1hr	√	
	Modes of cell injury: Mechanisms of cell injury	1hr	√	
	Reversible cell injury: Definitions, cellular swelling, fatty change.	1hr	√	
	Irreversible cell injury: Definition Necrosis & gangrene: definitions & types. Apoptosis & its relevance.	1hr	√	√
	Intracellular accumulations & alterations: Types of Intracellular accumulations with alterations in cell organelles & cytoskeleton.	1hr	√	
	Cellular adaptations & growth disturbances: Hypertrophy, Hyperplasia, Metaplasia, Agenesis, dysplasia.	1hr	√	
2	<b>Acute &amp; chronic Inflammation</b>	<b>3hrs</b>		
	Acute inflammation: Define & describe cellular & vascular changes. Outcomes & morphological patterns of acute inflammation.	1hr	√	
	Chemical mediators of inflammation: definition, classification, description of each type, role in acute & chronic inflammation.	1hr	√	
	Chronic inflammation: definition & causes. Granulomatous inflammation: etiology, pattern & systemic effects of granulomas.	1hr	√	
3	<b>Regeneration &amp; repair</b>	<b>3hrs</b>		
	Regeneration & repair: define & describe mechanism of regeneration & repair.	1hr	√	
	Healing by primary & secondary intention with local & systemic factors affecting wound healing.	1hr	√	
	Repair in specialized tissue: Describe repair in fractures & parenchymal organs.	1hr	√	

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	Course Contents	Hrs	Must Know	Desirable to know
4	<b>Circulatory disturbances</b>	5hrs		
	Hyperemia & congestion	1hr	√	
	Edema: Define, classify, pathogenesis & correlate morphology with clinical significance.	1hr	√	
	Thrombosis: Definition, etiopathogenesis, morphology, fate & effects of thrombosis.	1hr	√	
	Embolism & Infarction: Define types with clinical significance.	1hr	√	
	Shock: Define, classify, pathogenesis, mediators & stages of shock.	1hr	√	
5	<b>Genetic disorders</b>	1hr		
	Normal karyotype, classification of genetic disorders, types of genetic change.		√	
	Down's syndrome (Trisomy 21), Klinefelter's syndrome & Turner's syndrome.	1hr	√	
	Glycogen storage disease & lysosomal storage disorders.			√
6	<b>Disturbances of pigment metabolism</b>	1hr		
	Types, changes associated with common disturbances like lipofuscin, Hemosiderin, melanin & Bilirubin.	1hr	√	
7	<b>Disturbances of Mineral metabolism</b>	1hr		
	Types & morphological changes in calcification.		√	
	Disturbance of mineral like zinc	1hr		√
8	<b>Diseases of Immunity</b>	4hrs		
	Hypersensitivity reactions: Types & differentiate between different types of hypersensitivity reactions.		√	
	Transplant rejections	1hr		√
	Autoimmune diseases: Mechanism of autoimmunity, common autoimmune diseases, SLE.	1hr	√	
	Amyloidosis: Definition, physical & chemical nature of amyloid, classification, pathogenesis, morphology, lab diagnosis with special stain & clinical correlation.	1hr	√	

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	AIDS: Epidemiology, etiology, pathogenesis, morphology, clinical features, diagnosis & handling of infected materials & health education.	1hr	√	
9	<b>Infectious disease</b>	6hrs		
	Typhoid fever: Pathogenesis, morphology & clinical features.	1hr	√	
	Syphilis: Classify various stages, pathogenesis & morphology.	1hr	√	
	Tuberculosis: Epidemiology, etiology, pathogenesis, morphology, clinical features, lab diagnosis & importance of tuberculosis in the present day context.	1hr	√	
	Leprosy: Classify, pathogenesis, differentiate between different types of leprosy, histological features & sequelae.	1hr	√	
	Fungal: Classification of fungal diseases & opportunistic fungal infections.	1hr	√	
	<b>Parasitic:</b>		√	
	Malaria: Types, morphological features in P. Vivax & Falciparum Malaria & lab diagnosis.	1hr		
	Leishmaniasis, Filariasis, Hydatid, Cysticercosis			√
10	<b>Neoplasia</b>	5hrs		
	Nomenclature, classification & differentiation between benign & malignant neoplasms.	1hr	√	
	Precancerous lesions.			√
	Carcinogenesis	1hr	√	
	Tumor host interactions: Systemic effects & paraneoplastic syndromes.	1hr	√	
	Biology of tumor growth & Lab Diagnosis: Diagnostic workup including tumor markers.	1hr	√	
	Spread, grading & staging.	1hr	√	

  
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	Course Contents	Hrs	Must Know	Desirable to know
1	Hematopathology and transfusion medicine	16hrs		
	Introduction to hematology & hemopoiesis	1hr	√	
	Anemia: classification and clinical features.	1hr	√	
	Nutritional anemia: Iron deficiency	1hr	√	
	Folic acid/ Vit B12 deficiency anemia including pernicious anemia.	1hr	√	
	Hemolytic anemia: Definition, classification, pathogenesis and investigations.	1hr	√	
	Hereditary spherocytosis and G6PD deficiency.			√
	Haemoglobinopathies: Thalassemia, Sickle cell anemia.	1hr	√	
	Aplastic anemia	1hr	√	
	Hemorrhagic disorders: Classify and lab. Screening tests for hemorrhagic disorders. Platelet deficiency, ITP.	1hr		√
	Coagulopathies: Coagulation factor deficiency, hemophilia, DIC, factor VIII.	1hr	√	
	Leucocytic disorders: Leucocytosis, leucopenia, Leukemoid reaction.	1hr	√	
	Acute leukemia: classification and diagnosis.	1hr	√	
	Chronic leukemia: classification and diagnosis.	1hr	√	
	Paraproteinemias and Multiple myeloma	1hr	√	
	Myelodysplastic syndromes and Myeloproliferative disorders	1hr		√
	Blood groups and its relevance in transfusion medicine and hematology. Erythroblastosis foetalis.	1hr	√	
	Blood transfusion: Indications, selection of donor criteria, cross matching, untoward reactions, transmissible infections including HIV and hepatitis.	1hr	√	

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Course Contents			Must Know	Desirable to know
<b>Systemic Pathology</b>				
1	<b>Cardiovascular system</b>	<b>9hrs</b>		
	Hypertension & hypertensive heart disease: Mechanism, clinical course and sequel.	1hr	√	
	Atherosclerosis: Definition, etiopathogenesis, gross and microscopic features, complications and clinical correlation	1hr	√	
	Other diseases of blood vessels: Aneurysms Vasculitis.	1hr	√	√
	Ischemic heart disease: Categories and pathogenesis. Myocardial infarction : incidence, risk factors, pathogenesis, morphology, complications, clinical course and investigations	1hr	√	
	Rheumatic heart disease: Incidence, etiology, Pathogenesis, morphology, complications, clinical course & investigations.	1hr	√	
	Infective endocarditis: Causes, Pathogenesis, morphology, complications and differential diagnosis of cardiac vegetations.	1hr	√	
	Pericarditis and other pericardial diseases	1hr	√	
	Congenital heart disease: ASD, VSD, Fallot's teratology, Bicuspid aortic PDA	1hr		√
	Cardiomyopathies	1hr		√
2	<b>Respiratory system</b>	<b>7hrs</b>		
	Pneumonias: Etiopathogenesis, classifications, morphology, clinical course and complications.	1hr	√	
	Lung abscess: Etiopathogenesis, Morphology and complications.	1hr	√	
	Atelectasis and hyaline membrane disease.			√
	Chronic obstructive pulmonary disease: Bronchial asthma and Bronchiectasis -Etiopathogenesis, Morphology and complications.	1hr	√	

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	Chronic obstructive pulmonary disease: Chronic bronchitis and Emphysema: Etiopathogenesis, Morphology types of emphysema and complications.	1hr		
	Pulmonary tuberculosis: primary and secondary, morphologic types including pleuritis, clinical course.	1hr	√	
	Occupational lung disorders: Anthracosis, silicosis, asbestosis, mesothelioma.	1hr		√
	Tumors of lung and pleura: Classification, etiopathogenesis, gross and microscopic features, pattern of spread, staging, clinical course, para- neoplastic syndromes	1hr	√	
3	Oral cavity and salivary gland	2hrs		
	Precancerous lesions of oral cavity and oral cancers: etiopathogenesis, gross and microscopic features	1hr	√	
	Differential diagnosis of swelling of salivary gland.	1hr	√	
4	Gastrointestinal tract	5hrs		
	Gastritis: etiology and types.	1hr		√
	Peptic ulcer: definition, etiopathogenesis, gross and microscopic features and complications.		√	
	Ulcers of intestine: etiological classifications, morphology of typhoid, tubercular, amoebic ulcers and bacillary dysentery. Differential diagnosis of different forms of ulcers.	1hr	√	
	Idiopathic inflammatory bowel disease: etiopathogenesis, morphology and differences between Crohn's disease and ulcerative colitis.	1hr	√	
	Appendicitis		√	
	Tumors of upper Gastrointestinal Tract: Esophagus: etiopathogenesis, morphology and clinical features. Gastric carcinoma: etiopathogenesis, classification, gross and microscopic features and clinical features. Carcinoid tumors of GIT	1hr	√ √	√
	Tumors of lower Gastrointestinal Tract:  Carcinoma colon- Etiopathogenesis, morphology and clinical features. Intestinal polyps and gastrointestinal stromal tumors.	1hr	√	√

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	Course Contents		Must Know	Desirable to know
5	Liver and Biliary Tract	5hrs		
	Viral hepatitis: Etiopathogenesis, types, clinical source, pathology, serologic diagnosis, sequelae.	1hr	√	
	Alcoholic liver disease: Pathogenesis, morphology and correlation with clinical features.	1hr	√	
	Cirrhosis: Etiopathogenesis, classification, pathology, complications and differential diagnosis.	1hr	√	
	Portal Hypertension: Types and manifestations.		√	
	Tumors of liver: Pathology of hepatocellular carcinoma.	1hr	√	
	Disease of gall bladder: cholecystitis, cholelithiasis and tumors.	1hr		√
6	Urinary tract system	8hrs		
	Basics of impaired function and urinalysis	1hr	√	
	Nephritic and Nephrotic syndrome			
	Glomerulonephritis: Classification, Acute nephritis, rapidly progressive glomerulonephritis.	1hr	√	
	Renal failure: definitions, criteria, etiology, systemic manifestations and investigations.	1hr	√	
	Nephrolithiasis and obstructive nephropathy	1hr	√	
	Pyelonephritis and interstitial nephritis: etiopathogenesis of acute and chronic, morphology and clinical correlation.	1hr	√	
	Tumors of kidney and pelvis: classifications, morphology, clinical course and paraneoplastic syndromes of common tumors.	1hr	√	
	Renal vascular disorders and malformations, polycystic kidney.	1hr		√
	Urinary bladder: cystitis and carcinoma	1hr	√	

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Course Contents		Must Know	Desirable to know
7	<b>Female genital tract</b>	6hrs	
	Diseases of Uterus: Endometrial hyperplasia and carcinoma, adenomyosis, smooth muscle tumors	1hr	√
	Trophoblastic diseases: hydatidiform mole, choriocarcinoma.	1hr	
	Diseases of cervix: cervicitis, cervical carcinoma, etiology cytological diagnosis	1hr	√
	Ovarian tumors	1hr	√
	Pelvic inflammatory disease including salpingitis	1hr	√
	Genital tuberculosis		
	Breast: Non-neoplastic and Neoplastic lesions of the breast- Classification, Morphology, grading of carcinoma of breast and differential diagnosis of breast swellings.	1hr	√
8	<b>Male Genital System</b>	2hrs	
	Prostate: Nodular hyperplasia, carcinoma	1hr	√
	Testicular tumors and Carcinoma of penis	1hr	√
9	<b>Lymphoreticular system</b>	3hrs	
	Diseases of spleen: Splenomegaly and effects	1hr	
	Lymphadenitis: Non-specific, granulomatous		√
	Hodgkin's lymphoma, classification, morphology	1hr	√
	Non-Hodgkin's lymphoma, classification, morphology	1hr	
10	<b>Dermatopathology</b>	2hrs	
	Skin tumors: Non-pigmented -classification and morphology.	1hr	√
	Skin tumors: pigmented- classification and morphological features of common nevi and malignant melanoma.	1hr	√
11	<b>Soft tissue</b>	1hr	
	Classification, morphological features of lipomatous, fibrous, blood vessels tumors. Neural, muscle and fibro histiocytic tumors.	1hr	√

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	Course Contents	Hrs	Must Know	Desirable to know
12	<b>Skeletal System</b>	<b>3hrs</b>		
	Osteomyelitis and Metabolic diseases: rickets / osteomalacia, osteoporosis, hyperparathyroidism	1hr		√
	Tumors: Primary, osteosarcoma, osteoclastoma, Ewing's sarcoma, chondrosarcoma, metastatic	1hr	√	
	Arthritis: Rheumatoid, osteoid and tuberculous	1hr		√
13	<b>Central Nervous system</b>	<b>3hrs</b>		
	CSF and its disturbances: Cerebral oedema, raised intracranial pressure	1hr	√	
	Inflammatory disorders: Pyogenic and tuberculous meningitis, brain abscess, tuberculoma.		√	
	Classify CNS tumors-primary glioma and meningioma and metastatic	1hr	√	
	Cerebrovascular disease: atherosclerosis, thrombosis, embolism, aneurysm, hypoxia, infraction and hemorrhage	1hr		√
14.	<b>Endocrine system</b>	<b>4hrs</b>		
	Thyroid: Differential diagnosis of thyroid nodule.	1hr	√	
	Adrenal diseases: Cortical hyperplasia, atrophy, tuberculosis, tumors of cortex and medulla.	1hr		√
	Parathyroid hiperplasias and tumours , hyperparathyroidism. Pituitary tumors	1hr		√
15.	<b>Myopathies: Differential diagnosis of common muscle disorders.</b>	<b>1hr</b>		√
	<b>Clinical Pathology</b>	<b>3hrs</b>		
1.	Jaundice: Differential diagnosis and laboratory investigations in jaundice.	1hr	√	
2.	Diabetes mellitus: Classification, pathogenesis of system involvement, sequelae and complications.	1hr	√	
3.	Renal function tests	1hr	√	

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	Medical Autopsy	1hr		
1.	Indications and techniques of medical autopsies	1hr	√	

**Tutorials and Integrated teaching:**

**A Hematology**

- 1 Blood Collection and anticoagulant
- 2 Peripheral Smear
- 3 Iron deficiency Anemia
- 4 Megaloblastic Anemia
- 5 Hemolytic Anemia
- 6 Erythrocyte sedimentation Rate ( ESR) & Packed Cell Volume (PCV)
- 7 Acute Leukemia
- 8 Chronic Leukemia
- 9 Bone Marrow Examination

**B General Pathology**


- 1 Cell injury & Cell death
- 2 Intracellular accumulations
- 3 Inflammation & Repair
- 4 Circulatory Disturbances
- 5 Infections
- 6 Neoplasia
- 7 HIV/AIDS

**C Systemic Pathology**

- 1 Atherosclerosis & Ischemic heart disease
- 2 Rheumatic heart disease
- 3 Infective Endocarditis


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- 4 Pneumonias
- 5 Tumors of Lung
- 6 Cirrhosis
- 7 Glomerulonephritis
- 8 Peptic Ulcer
- 9 Ulcers of Intestine
- 10 Carcinoma Breast
- 11 Carcinoma Cervix
- 12 Bone tumors
- 13 Museum Specimens
- D Clinical Pathology**
- 1 Liver function tests
- 2 Renal function tests
- 3 Gastric function tests
- 4 Cerebrospinal Fluid Examination (CSF)
- 5 Urine Examination

  
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## PRACTICAL

1. One – third of allotted practical hours to be devoted to
  - a. Performing a complete urine examination and detecting abnormalities and correlating with pathological changes.
  - b. To perform with accuracy and reliability basic hematological estimation: TLC, DLC, peripheral smear, staining, reporting along with history.
2. One third of allotted practical hours to be devoted to  
Identify and interpret gross and microscopic features of inflammatory lesions of different organs and common systemic diseases.
3. One third of allotted practical hours to be devoted to  
Discussion of case studies (paper) clinical, gross and microscopic features and other parameters wherever applicable to learn clinico-pathological correlations.

  
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Practical Syllabus:

Clinical Pathology	
1	Introduction to Pathology
2	Blood collection and anticoagulants
3	Hemoglobin estimation, RBC Count, ESR & PCV
4	Total WBC count
5	Differential WBC count
6	Development of blood & bone marrow examination.
7	Laboratory investigations in anemias :
8	Acute Leukemia
9	Chronic Leukemia
10	Blood grouping
11	Urine Analysis
12	Examination of CSF
13	Bleeding disorders
14	Sputum and fluids
15	Renal function tests and clinical charts
16	Liver function tests and clinical charts
17	Gastric & Pancreatic function tests and clinical charts
18	Investigations in infertility
19	<del>Investigations in PUO</del> X
20	<del>Examination of faeces &amp; malabsorption</del> X

  
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General and Systemic Pathology


- 1 Microscope and microscopic study of cells and tissues.
- 2 Cell injury & adaptation.
- 3 Necrosis and Gangrene
- 4 Pigments
- 5 Amyloidosis
- 6 Acute inflammation
- 7 Chronic inflammation & repair
- 8 Typhoid & syphilis
- 9 Tuberculosis and Amoebic inflammation
- 10 Circulatory disturbances I, II & III
- 11 Disorders of cell growth
- 12 Tumor Pathology I & II
- 13 Immuno Pathology I & II
- 14 Respiratory System I & II
- 15 Cardiovascular System I & II
- 16 Alimentary System I, II & III
- 17 Hepatobiliary System I & II
- 18 Diseases of Kidney I & II
- 19 Female reproductive System
- 20 Male reproductive System
- 21 Lymph nodes and Spleen
- 22 Skeletal System
- 23 Diseases of Skin
- 24 Central nervous System
- 25 Tumors of Breast and Diseases of the endocrine organs

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Prof. & Head

## EXAMINATION SKILLS

### Skills

- 1 Be able to collect, store and transport materials for various pathological tests including histopathology, cytopathology, clinical pathology, hematology and biochemistry.
- 2 Interpret abnormal laboratory values of common diseases
- 3 Do complete urine examination including microscopy.
- 4 Do perform and interpret hemoglobin, TLC, DLC, ESR, PCV, peripheral blood smears and red cell morphology.
- 5 Interpret the peripheral smears of common diseases.
- 6 Do blood grouping and cross matching
- 7 Adapt universal precautions for self protection against HIV and hepatitis and counsel the patient.

  
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Semester / Term Ending Theory and Practical Examination in Pathology

Semester	Theory Marks	Practical Marks
III	40	40
IV	40	40
V	40	40
<b>Total</b>	<b>120</b>	<b>120</b>

There will be single theory paper at the end of each semester. The pattern for theory & Practical examination will be same as Pathology University Examination.

**Pathology University Examination: Theory, Practicals and Viva**

1. Scheme of internal assessment (Pathology) : The computation of internal assessment marks shall be as per rule No 2 and 3 mentioned in this rule and regulation
2. Pattern of Theory Examination including Distribution of Marks, Questions and Time.
  - a. Distribution of Marks

Sr.No		Total marks
1	Theory ( 2 papers - 40 marks each)	80
2	Oral (Viva)	15
3	Practical	25
4	Internal assessment ( Theory -15, Practicals -15)	30
	<b>Total</b>	<b>150</b>

- i) Total duration - 4 hrs (each paper of 2 hrs or 120 minutes)
- ii) Each paper will have 3 sections.
- iii) Pattern and marking for each paper of 40 marks as provided in the table.

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Sections	Nature of Question- Two Theory Papers	Total No. of Questions	Mark (s) per Question	Total Marks
A)	Multiple Choice Questions (MCQs)	16	16x1/2	08
B)	Brief Answer Questions (BAQs)	4 out of 5	4 x 4	16
C)	Long Answer Question (LAQ)	2 out of 3	2 x 8	16
Total				40

1. Direction- Only short answer questions may be permitted from the portions marked as "Desirable to know"

- Paper wise distribution of theory topics and number of questions:-

A) Paper I:

General Pathology inclusive of general neoplasia, Haematology inclusive of transfusion medicine.

Out of 3 LAQs in Section C, 2 questions should be from General Pathology and General Neoplasia and one question should be from Haematology inclusive of transfusion medicine.

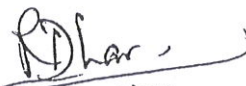
B) Paper II:

Systemic Pathology inclusive of Systemic Neoplasia and Clinical Pathology. Out of 3 LAQs in Section C, 2 questions should be from Systemic Pathology and Systemic Neoplasia and one question should be from Clinical Pathology.

4. Marking scheme: Each paper of 40 marks as shown in the above table.

5. University examination Nature of practicals and duration (Pathology)

a) Number of students for practical Examination should not exceed more than 30 /day

  
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## b) Practicals

Marks 25

	Practicals		Marks
a.	10 Spots (2 minutes each)	4 specimen, 3 histopathology, 1 hematology slide, 1 instrument and 1 chart  Identification – 1/2 mark Specific short question - 1/2 mark 1 Mark for each spot	10 Marks
b.	Urine Examination	Physical Examination and two abnormal constituents.	05 Marks
c.	Histopathology slide	Draw, label and give diagnosis.	03 Marks
d.	Haematology Examination	Peripheral blood smear : stain and report.	03 Marks
		Hemoglobin Estimation / Total leukocyte count / Blood group Estimation.	04 Marks
		<b>Total</b>	25 Marks

C. Viva: Duration and topic distribution: Viva marks shall be added to theory and shall be submitted separately out of 15 Marks.

Viva consists of two tables; on each table the student will face 2 examiners for 5 minutes each:

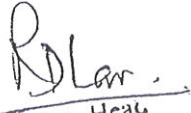
Table - I General and Systemic Pathology

7 Marks

Table - II Clinical Pathology and Haematology

8 Marks

Total 15 Marks

  
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#### TEACHING LEARNING METHODS:

- Structured interactive sessions
- Small group discussion
- Practical including demonstrations
- Problem based exercises
- Self learning tools
- Interactive learning
- E-modules


#### LEARNING RESOURCE MATERIALS:

- Text books
  - 1) Robbin's : Pathologic basis of Disease
  - 2) Hematology De Gruchy
  - 3) Text book of Pathology by Harsh Mohan
  - 4) Clinical Pathology: A Practical Manual by Sabitri Sanyal
- Reference books
- Practical note books
- Internet resources

#### TIME OF EVALUATION:

There should be regular formative assessment. Formative assessment, day to day performance should be given greater importance. Examination of pathology should be at the end of 5<sup>th</sup> semester and formative assessment in middle of 3<sup>rd</sup> and 4<sup>th</sup> semester and summative assessment at the end of 5<sup>th</sup> semester.

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Approved in BOM 43/2015, dated 06/11/2015 resolution no. 3.2 (d)

Resolution No. 3.2(d): Resolved to delete the topics OSPE, Mal absorption, PUO, Gastric Analysis in Practical of Pathology (UG) for the batch of Students entering into 2<sup>nd</sup> MBBS from the academic year 2016-17 onwards.

Approved in Bom 43/2015, Dated 06/11/2015, Resolution No. - 3.3(d)

Resolution No. 3.3(d): Resolved that the basic research methodology should be taught to UG and PG-students for all courses as per their regulatory Council Norms.

Approved in Bom 32/2013, Dated 29/10/2013

Resolution No. - 5.2.4.

5.2.4 Introduction of "Quality control in Laboratory" in MD Pathology

Resolution No. 5.2.4 : Resolved to add topic "Quality control in Laboratory" in MD Pathology theory syllabus.

Ref.: MGM/Patho./2016/O- 272

Date : 06.01.2016

To,  
Dr. Rajesh Goel  
Dy. Registrar  
MGM Institute of Health Sciences,  
Kamothe, Navi Mumbai.

Dear Sir,

Hereby submitting the final revised syllabus for II year MBBS for Pathology subject. This syllabus was discussed and approved in the last BOS meeting which was in the month of October 2015.

Thanking you,  
Yours Truly,

*R. Dhar*  
*6/1/16*

Dr. Reeta Dhar  
Professor & Head  
Department of Pathology

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*[Signature]*  
*6/1/16*

MGM Institute Of Health Sciences  
INWARD NO. 145  
DATE: 21.11

# PATHOLOGY

## I. Learning Objectives

At the end of the course, the Student shall be able to,

1. Understand and describe the structure & ultra structure of a cell, the concept of cell injury, cell death, repair and the change produces thereby, in different tissues and organs.
2. Know the principles of collection, handling, storage, and dispatch of clinical samples from patient, in a proper manner.
3. Perform and interpret in a proper manner the basic clinico-pathological procedures.
4. Knowledge of the common hematological disorders and the investigations necessary to diagnose them and determine their prognosis.
5. Understand normal haemostatic mechanism, the derangements of this mechanism and the effect on human system.
6. Understand the etiopathogenesis, the pathological effects, and the clinico-pathological correlation of common infectious and non-infectious diseases.
7. Understand the concept of neoplasia with respect to etiology, gross and microscopic features, diagnosis and prognosis in different tissues and organs of the body.
8. Correlate normal and altered morphology (gross and microscopy) of different organ systems in different diseases to the extent needed of understanding of the disease processes and their clinical significance.
9. Have knowledge of common immunological disorders and their effects on human body.

*R. D. Hegde*  
6/11/2016  
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**II. Total number of teaching hours: 300hrs (IIIrd, IVth & Vth Semester)**

a) Theory ( lectures & tutorials )	160 hrs
b) Practicals	110 hrs
c)Revisions & Evaluations (internal)	30 hrs
<b>Total</b>	<b>300hrs</b>

**III. Distribution of teaching hours:**

1) General Pathology	36hrs
2) Hematology	16hrs
3) Systemic Pathology	57hrs
4) Clinical Pathology	03hrs
6) Autopsy	01hrs
5) Tutorials	47hrs
<b>Total</b>	<b>160hrs</b>

	Course Contents	Hrs	Must Know	Desirable to know	Nice to know
<b>General Pathology</b>					
<b>1</b>	<b>Cell injury</b>	<b>6hrs</b>			
	Common definitions in pathology and causes of cell injury.	1hr	√		
	Modes of cell injury: Mechanisms of cell injury	1hr	√		
	Reversible cell injury: Definitions, cellular swelling, fatty change.	1hr	√		
	Irreversible cell injury: Definition Necrosis & gangrene: definitions & types. Apoptosis & its relevance.	1hr	√	√	
	Intracellular accumulations & alterations: Types of Intracellular accumulations with alterations in cell organelles & cytoskeleton.	1hr	√		
	Cellular adaptations & growth disturbances: Hypertrophy, Hyperplasia, Metaplasia, Agenesis, dysplasia.	1hr	√		
	Cellular ageing and mechanism				√
<b>2</b>	<b>Acute &amp; chronic Inflammation</b>	<b>3hrs</b>			
	Acute inflammation: Define & describe cellular & vascular changes. Outcomes & morphological patterns of acute inflammation.	1hr	√		
	Chemical mediators of inflammation: definition, classification, description of each type, role in acute & chronic inflammation.	1hr	√		
	Chronic inflammation: definition & causes.	1hr	√		
	Granulomatous inflammation: etiology, pattern & systemic effects of granulomas.				
<b>3</b>	<b>Regeneration &amp; repair</b>	<b>3hrs</b>			
	Regeneration & repair: define & describe mechanism of regeneration & repair.	1hr	√		
	Healing by primary & secondary intention with local & systemic factors affecting wound healing.	1hr	√		
	Repair in specialized tissue: Describe repair in fractures & parenchymal organs.	1hr	√		
	Stem cell concept-Regenerative medicine				√

4	<b>Circulatory disturbances</b>	<b>5hrs</b>			
	Hyperemia & congestion	1hr	√		
	Edema: Define, classify, pathogenesis & correlate morphology with clinical significance.	1hr	√		
	Thrombosis: Definition, etiopathogenesis, morphology, fate & effects of thrombosis.	1hr	√		
	Embolism & Infarction: Define types with clinical significance.	1hr	√		
	Shock: Define, classify, pathogenesis, mediators & stages of shock.	1hr	√		
5	<b>Genetic disorders</b>	<b>1hr</b>			
	Normal karyotype, classification of genetic disorders, types of genetic change.	1hr	√		
	Down's syndrome (Trisomy 21), Klinefelter's syndrome & Turner's syndrome.		√		
	Glycogen storage disease & lysosomal storage disorders.			√	
6	<b>Disturbances of pigment metabolism</b>	<b>1hr</b>			
	Types, changes associated with common disturbances like lipofuscin, Hemosiderin, melanin & Bilirubin.	1hr	√		
7	<b>Disturbances of Mineral metabolism</b>	<b>1hr</b>			
	Types & morphological changes in calcification.	1hr	√		
	Disturbance of mineral like zinc			√	
8	<b>Diseases of Immunity</b>	<b>4hrs</b>			
	Hypersensitivity reactions: Types & differentiate between different types of hypersensitivity reactions.	1hr	√		
	Transplant rejections			√	
	Autoimmune diseases: Mechanism of autoimmunity, common autoimmune diseases, SLE.	1hr	√		
	Amyloidosis: Definition, physical & chemical nature of amyloid, classification, pathogenesis, morphology, lab diagnosis with special stain & clinical correlation.	1hr	√		

	AIDS: Epidemiology, etiology, pathogenesis, morphology, clinical features, diagnosis & handling of infected materials & health education.	1hr	√		
<b>9</b>	<b>Infectious disease</b>	<b>7hrs</b>			
	<b>Typhoid fever:</b> Pathogenesis, morphology & clinical features.	1hr	√		
	<b>Syphilis:</b> Classify various stages, pathogenesis & morphology.	1hr	√		
	<b>Tuberculosis:</b> Epidemiology, etiology, pathogenesis, morphology, clinical features, lab diagnosis & importance of tuberculosis in the present day context.	2hr	√		
	<b>Leprosy:</b> Classify, pathogenesis, differentiate between different types of leprosy, histological features & sequelae.	1hr	√		
	<b>Fungal:</b> Classification of fungal diseases & opportunistic fungal infections.	1hr	√		
	<b>Parasitic:</b> Malaria: Types, morphological features in P. Vivax & Falciparum Malaria & lab diagnosis.	1hr	√		
	Leishmaniasis, Filariasis, Hydatid, Cysticercosis			√	
<b>10</b>	<b>Neoplasia</b>	<b>5 hrs</b>			
	Nomenclature, classification & differentiation between benign & malignant neoplasms.	1hr	√		
	Precancerous lesions.			√	
	Carcinogenesis	1hr	√		
	Tumor host interactions: Systemic effects & paraneoplastic syndromes.	1hr	√		
	Biology of tumor growth & Lab Diagnosis: Diagnostic workup including tumor markers.	1hr	√		
	Spread, grading & staging.	1hr	√		
	Molecular basis of cancer				√
	Tumor immunology				√
<b>11</b>	<b>Environmental Pathology</b>	<b>1hr</b>			
	Air pollution, Iatrogenic drug injury. Radiation & physical injury & Obesity, Tobacco & Alcoholism	1hr			√

	Course Contents	Hrs	Must Know	Desirable to know	Nice to know
1	<b>Hematopathology and transfusion medicine</b>	<b>16hrs</b>			
	Introduction to hematology & hemopoiesis	1hr	√		
	Anemia: classification and clinical features.	1hr	√		
	Nutritional anemia: Iron deficiency, Folic acid/ Vit B12 deficiency anemia including pernicious anemia.	2hr	√		
	Hemolytic anemia: Definition, classification, pathogenesis and investigations.	1hr	√		
	Hereditary spherocytosis and G6PD deficiency.			√	
	Haemoglobinopathies: Thalassemia, Sickle cell anemia.	1hr	√		
	Aplastic anemia	1hr	√		
	Hemorrhagic disorders: Classify and lab. Screening tests for hemorrhagic disorders. Platelet deficiency, ITP.	1hr		√	
	Coagulopathies: Coagulation factor deficiency, hemophilia, DIC.	1hr	√		
	Leucocytic disorders: Leucocytosis, leucopenia, Leukemoid reaction.	1hr	√		
	Acute leukemia: classification and diagnosis.	1hr	√		
	Chronic leukemia: classification and diagnosis.	1hr	√		
	Paraproteinemias: Multiple myeloma	1hr	√		
	Myelodysplastic syndromes and Myeloproliferative disorders	1hr		√	
	Blood groups and its relevance in transfusion medicine and hematology. Erythroblastosis foetalis.	1hr	√		
	Blood transfusion: Indications, selection of donor criteria, cross matching, untoward reactions, transmissible infections including HIV and hepatitis.	1hr	√		

	Course Contents	Hrs	Must Knew	Desirable to know	Nice to know
	<b>Systemic Pathology</b>				
1	<b>Cardiovascular system</b>	<b>9hrs</b>			
	Hypertension & hypertensive heart disease	1hr	√		
	Atherosclerosis: Definition, etiopathogenesis, gross and microscopic features, complications and clinical correlation	1hr	√		
	Other diseases of blood vessels : Aneurysms Vasculitis	1hr	√	√	
	Ischemic heart disease: Categories and pathogenesis. Myocardial infarction : incidence, risk factors, pathogenesis, morphology, complications, clinical course and investigations	1hr	√		
	Rheumatic heart disease: Incidence, etiology, Pathogenesis, morphology, complications, clinical course & investigations.	1hr	√		
	Infective endocarditis: Causes, Pathogenesis, morphology, complications and differential diagnosis of cardiac vegetations.	1hr	√		
	Pericarditis and other pericardial diseases	1hr	√		
	Congenital heart disease: ASD, VSD, Fallot's teratology, Bicuspid aortic PDA	1hr		√	
	Cardiomyopathies	1hr		√	
2	<b>Respiratory system</b>	<b>8hrs</b>			
	<b>Pneumonias:</b> Etiopathogenesis, classifications, morphology, clinical course and complications.	1hr	√		
	<b>Lung abscess:</b> Etiopathogenesis, Morphology and complications.	1hr	√		
	Atelectasis and hyaline membrane disease.			√	
	Chronic obstructive pulmonary disease: Bronchial asthma and Bronchiectasis -Etiopathogenesis, Morphology and complications.	1hr	√		
	Chronic bronchitis and Emphysema: Etiopathogenesis, Morphology types of emphysema and complications.	1hr	√		
	Pulmonary tuberculosis: primary and secondary, morphologic types including pleuritis, clinical course.	1hr	√		



	Occupational lung disorders: Anthracosis, silicosis, asbestosis, mesothelioma.	1hr		√	
	Tumors of lung and pleura: Classification, etiopathogenesis, gross and microscopic features, pattern of spread, staging, clinical course, paraneoplastic syndromes.	1hr	√		
3	<b>Oral cavity and salivary gland</b>	<b>2hrs</b>			
	Precancerous lesions of oral cavity and oral cancers: etiopathogenesis, gross and microscopic features.	1hr	√		
	Differential diagnosis of swelling of salivary gland.	1hr	√		
4	<b>Gastrointestinal tract</b>	<b>5hrs</b>			
	Gastritis: etiology and types.	1hr		√	
	Peptic ulcer: definition, etiopathogenesis, gross and microscopic features and complications.		√		
	Ulcers of intestine: etiological classifications, morphology of typhoid, tubercular, amoebic ulcers and bacillary dysentery. Differential diagnosis of different forms of ulcers.	1hr	√		
	Idiopathic inflammatory bowel disease: etiopathogenesis, morphology and differences between Crohn's disease and ulcerative colitis.	1hr	√		
	Appendicitis		√		
	Tumors of upper Gastrointestinal Tract: Esophagus: etiopathogenesis, morphology and clinical features. Gastric carcinoma: etiopathogenesis, classification, gross and microscopic features and clinical features. Carcinoid tumors of GIT.	1hr	√		√
	Tumors of lower Gastrointestinal Tract: Carcinoma colon- Etiopathogenesis, morphology and clinical features.	1hr	√		
	Intestinal polyps and gastrointestinal stromal tumors.			√	
5	<b>Liver and Biliary Tract</b>	<b>5hrs</b>			
	Viral hepatitis: Etiopathogenesis, types, clinical source, pathology, serologic diagnosis, sequelae.	1hr	√		
	Alcoholic liver disease: Pathogenesis, morphology and correlation with clinical features.	1hr	√		
	Cirrhosis: Etiopathogenesis, classification, pathology, complications & differential diagnosis.	1hr	√		

	Portal Hypertension: Types and manifestations.		√		
	Tumors of liver: Pathology of hepatocellular carcinoma.	1 hr	√		
	Disease of gall bladder: cholecystitis, cholelithiasis and tumors.	1 hr		√	
6	<b>Urinary tract system</b>	<b>8hrs</b>			
	Basics of impaired function and urinalysis	1 hr	√		
	Nephritic and Nephrotic syndrome				√
	Glomerulonephritis: Classification, Acute nephritis, rapidly progressive glomerulonephritis.	1 hr	√		
	Renal failure: definitions, criteria, etiology, systemic manifestations and investigations.	1 hr	√		
	Nephrolithiasis and obstructive nephropathy	1 hr	√		
	Pyelonephritis and interstitial nephritis: etiopathogenesis of acute and chronic, morphology and clinical correlation.	1 hr	√		
	Tumors of kidney and pelvis: classifications, morphology, clinical course and paraneoplastic syndromes of common tumors.	1 hr	√		
	Renal vascular disorders and malformations, polycystic kidney.	1 hr		√	
	Urinary bladder: cystitis and carcinoma	1 hr	√		
7	<b>Female genital tract</b>	<b>6hrs</b>			
	Diseases of Uterus: Endometrial hyperplasia and carcinoma, adenomyosis, smooth muscle tumors	1 hr	√		
	Trophoblastic diseases: hydatidiform mole, choriocarcinoma.	1 hr		√	
	Diseases of cervix: cervicitis, cervical carcinoma, etiology cytological diagnosis	1 hr	√		
	Ovarian tumors	1 hr	√		
	Pelvic inflammatory disease including salpingitis	1 hr	√		
	Genital tuberculosis			√	
	Breast: Non-neoplastic and Neoplastic lesions of the breast- Classification, Morphology, grading of carcinoma of breast and differential diagnosis of breast swellings.	1 hr	√		

8	<b>Male Genital System</b>	<b>3hrs</b>			
	Prostate: Nodular hyperplasia, carcinoma	1hr	√		
	Testicular tumors	1hr	√		
	Carcinoma of penis	1hr	√		
9	<b>Lymphoreticular system</b>	<b>3hrs</b>			
	Diseases of spleen: Splenomegaly and effects	1hr		√	
	Lymphadenitis: Non-specific, granulomatous		√		
	Hodgkin's lymphoma, classification, morphology	1hr	√		
	Non-Hodgkin's lymphoma, classification, morphology	1hr	√		
10	<b>Dermatopathology</b>	<b>2hrs</b>			
	Skin tumors: Non-pigmented -classification and morphology.	1hr	√		
	Skin tumors: pigmented- classification and morphological features of common nevi and malignant melanoma.	1hr	√		
11	<b>Soft tissue</b>	<b>1hr</b>			
	Classification, morphological features of lipomatous, fibrous, blood vessels tumors. Neural, muscle and fibro histiocytic tumors.	1hr	√		
12	<b>Skeletal System</b>	<b>3hrs</b>			
	Osteomyelitis and Metabolic diseases: rickets / osteomalacia, osteoporosis, hyperparathyroidism	1hr		√	
	Tumors: Primary, osteosarcoma, osteoclastoma, Ewing's sarcoma, chondrosarcoma, metastatic	1hr	√		
	Arthritis: rheumatoid, osteoid and tuberculosis	1hr		√	
13	<b>Central Nervous system</b>	<b>3hrs</b>			
	CSF and its disturbances: Cerebral oedema, raised intracranial pressure	1hr	√		
	Inflammatory disorders: Pyogenic and tuberculous meningitis, brain abscess, tuberculoma.		√		
	Cerebrovascular disease: atherosclerosis, thrombosis, embolism, aneurysm, hypoxia, infraction and hemorrhage	1hr		√	
	Classify CNS tumors-primary glioma and meningioma and metastatic	1hr	√		

14	<b>Endocrine system</b>	<b>4hrs</b>			
	Thyroid: Differential diagnosis of thyroid nodule.	1hr	√		
	Adrenal diseases: Cortical hyperplasia, atrophy, tuberculosis, tumors of cortex and medulla.	1hr		√	
	Parathyroid hiperplasias and tumours , hyperparathyroidism. Pituitary tumors	1hr		√	
15	<b>Myopathies:</b> Differential diagnosis of common muscle disorders.	<b>1hr</b>		√	
	<b>Clinical Pathology</b>	<b>3hrs</b>			√
1	Jaundice: Differential diagnosis and laboratory investigations in jaundice.	1hr	√		
2	Diabetes mellitus: Classification, pathogenesis of system involvement, sequelae and complications.	1hr	√		
3	Renal function tests	1hr	√		
	<b>Medical Autopsy</b>	<b>1hr</b>			
1	Indications and techniques of medical autopsies	1hr	√		

**Tutorials and Integrated teaching:**

**A Hematology**

- 1 Blood Collection and anticoagulant
- 2 Peripheral Smear
- 3 Iron deficiency Anemia
- 4 Megaloblastic Anemia
- 5 Hemolytic Anemia
- 6 Erythrocyte sedimentation Rate ( ESR) & Packed Cell Volume (PCV)
- 7 Acute Leukemia
- 8 Chronic Leukemia
- 9 Bone Marrow Examination

**B General Pathology**

- 1 Cell injury & Cell death
- 2 Intracellular accumulations
- 3 Inflammation & Repair
- 4 Circulatory Disturbances
- 5 Infections
- 6 Neoplasia
- 7 HIV/AIDS

**C Systemic Pathology**

- 1 Atherosclerosis & Ischemic heart disease
- 2 Rheumatic heart disease
- 3 Infective Endocarditis
- 4 Pneumonias

- 5 Tumors of Lung
- 6 Cirrhosis
- 7 Glomerulonephritis
- 8 Peptic Ulcer
- 9 Ulcers of Intestine
- 10 Carcinoma Breast
- 11 Carcinoma Cervix
- 12 Bone tumors
- 13 Museum Specimens

**D Clinical Pathology**

- 1 Liver function test & clinical charts
- 2 Renal function test & clinical charts
- 3 Gastric function test & clinical charts
- 4 Cerebrospinal Fluid Examination (CSF)
- 5 Urine Examination



**PRACTICAL:**

1. One – third of allotted practical hours to be devoted to
  - a. Performing a complete urine examination and detecting abnormalities and correlating with pathological changes.
  - b. To perform with accuracy and reliability basic hematological estimation: TLC DLC, peripheral smear, staining, reporting along with history.
2. One third of allotted practical hours to be devoted to  
Identify and interpret gross and microscopic features of inflammatory lesions of different organs and common systemic diseases.
3. One third of allotted practical hours to be devoted to  
Discussion of case studies (paper) clinical, gross and microscopic features and other parameters wherever applicable to learn clinico-pathological correlations.

Practical Syllabus:

**Clinical Pathology**

- 1 Introduction to Pathology
- 2 Blood collection and anticoagulants
- 3 Hemoglobin estimation
- 4 Total WBC count
- 5 Differential WBC count
- 6 Development of blood & bone marrow examination.
- 7 Laboratory investigations in anemias :
- 8 Acute Leukemia
- 9 Chronic Leukemia
- 10 Blood grouping
- 11 Urine Examination
- 12 Examination of CSF
- 13 Bleeding disorders
- 14 Sputum and fluid tests
- 15 Renal function tests
- 16 Liver function tests
- 17 Gastric & Pancreatic function tests
- 18 Investigations in infertility

## General and Systemic Pathology

- 1 Microscope and microscopic study of cells and tissues
- 2 Retrogressive changes
- 3 Necrosis and Gangrene
- 4 Pigments
- 5 Amyloidosis
- 6 Acute inflammation
- 7 Chronic inflammation & repair
- 8 Typhoid & syphilis
- 9 Tuberculosis and Leprosy
- 10 Circulatory disturbances I, II & III
- 11 Disorders of cell growth
- 12 Tumor Pathology I & II
- 13 Immuno Pathology I & II
- 14 Respiratory System I & II
- 15 Cardiovascular System I & II
- 16 Alimentary System I, II & III
- 17 Hepatobiliary System I & II
- 18 Diseases of Kidney I & II
- 19 Female reproductive System
- 20 Male reproductive System
- 21 Lymph nodes and Spleen
- 22 Skeletal System
- 23 Diseases of Skin
- 24 Central nervous System
- 25 Tumors of Breast and Diseases of the endocrine organs

## EXAMINATION SKILLS

- 1 Be able to collect, store and transport materials for various pathological tests including histopathology, cytopathology, clinical pathology, hematology and biochemistry.
- 2 Interpret abnormal laboratory values of common diseases
- 3 Do complete urine examination including microscopy.
- 4 Do perform and interpret hemoglobin, TLC, DLC, ESR, PCV, peripheral blood smears and red cell morphology.
- 5 Interpret the peripheral smears of common diseases.
- 6 Do blood grouping and cross matching
- 7 Adapt universal precautions for self protection against HIV and hepatitis and counsel the patient.

## Semester / Term Ending Theory and Practical Examination in Pathology

Semester	Theory Marks	Practical Marks
III	40	40
IV	40	40
V	40	40
<b>Total</b>	<b>120</b>	<b>120</b>

There will be single theory paper at the end of each semester. The pattern for theory & Practical examination will be same as **Pathology University Examination**.

### **Pathology University Examination: Theory, Practicals and Viva**

1. Scheme of internal assessment (Pathology) : The computation of internal assessment marks shall be as per rule No 2 and 3 mentioned in this rule and regulation
2. Pattern of Theory Examination including Distribution of Marks, Questions and Time.

a. **Distribution of Marks**

Sr.No		Total marks
1	Theory ( 2 papers - 40 marks each)	80
2	Oral (Viva)	15
3	Practical	25
4	Internal assessment ( Theory -15, Practicals -15)	30
	<b>Total</b>	<b>150</b>

- i) Total duration - 4 hrs (each paper of 2 hrs or 120 minutes)
- ii) Each paper will have 3 sections.
- iii) Pattern and marking for each paper of 40 marks as provided in the table

Sections	Nature of Question- Two Theory Papers	Total No. of Questions	Mark (s) per Question	Total Marks
A)	Multiple Choice Questions (MCQs)	16	1/2	08
B)	Brief Answer Questions (BAQs)	4 out of 5	4 x 4	16
C)	Long Answer Question (LAQ)	2 out of 3	2 x 8	16
<b>Total</b>				<b>40</b>

1. **Direction- Only short answer questions may be permitted from the portions marked as "Desirable to know"**

**- Paper wise distribution of theory topics and number of questions:-**

**A) Paper I:**

**General Pathology inclusive of general neoplasia, Haematology inclusive of transfusion medicine.**

Out of 3 LAQs in Section C, 2 questions should be from General Pathology and General Neoplasia and one question should be from Haematology inclusive of transfusion medicine.

**B) Paper II:**

**Systemic Pathology inclusive of Systemic Neoplasia and Clinical Pathology.**

Out of 3 LAQs in Section C, 2 questions should be from Systemic Pathology and Systemic Neoplasia and one question should be from Clinical Pathology.

4. **Marking scheme:** Each paper of 40 marks as shown in the above table.

5. **University examination Nature of practicals and duration (Pathology)**

a) Number of students for practical Examination should not exceed more than 35 /day



## b) Practicals

Marks 25

	Practicals		Marks
a.	10 Spots (2 minutes each)	4 specimen, 3 histopathology, 1 hematology slide, 1 instrument and 1 chart  Identification – 1/2 mark Specific short question - 1/2 mark 1 Mark for each spot	10 Marks
b.	Urine Examination	Physical Examination and two abnormal constituents.	05 Marks
c.	Histopathology slide	Draw, label and give diagnosis.	03 Marks
d.	Haematology Examination	Peripheral blood smear staining and do differential leukocyte count.	03 Marks
		Hemoglobin Estimation / Total leukocyte count / Blood group Estimation.	04 Marks
		<b>Total</b>	25 Marks

**C. Viva: Duration and topic distribution: Viva marks shall be added to theory and shall be submitted separately out of 15 Marks.**

**Viva consists of two tables; on each table the student will face 2 examiners for 5 minutes each:**

Table - I General and Systemic Pathology

7 Marks

Table - II Clinical Pathology and Haematology

8 Marks

<b>Total 15 Marks</b>
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#### TEACHING LEARNING METHODS:

- Structured interactive sessions
- Small group discussion
- Practical including demonstrations
- Problem based exercises
- Self learning tools
- Interactive learning
- E-modules

#### LEARNING RESOURCE MATERIALS:

- Text books
  - 1) Robbin's : Pathologic basis of Disease
  - 2) Hematology De Gruchy
  - 3)Text book of Pathology by Harsh Mohan
  - 4) Clinical Pathology: A Practical Manual by Sabitri Sanyal
- Reference books
- Practical note books
- Internet resources

#### TIME OF EVALUATION:

There should be regular formative assessment. Formative assessment, day to day performance should be given greater importance. Examination of pathology should be at the end of 5<sup>th</sup> semester and formative assessment in middle of 3<sup>rd</sup> and 4<sup>th</sup> semester and summative assessment at the end of 5<sup>th</sup> semester.

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Approved in SOM 45/2016, Date 28/04/2016

Resolution No. 3.2(b)

Resolution No. 3.2(b): Resolved to accept revised method to calculate internal assessment marks for IInd MBBS Exam effective from batch entering into 2<sup>nd</sup> MBBS from August 2016 onwards.

For Theory:

	Microbiology	Pharmacology	Pathology	FMT
III <sup>rd</sup> , IV <sup>th</sup> Sem. & Prelim Exam.	10	10	10	07
Day to day assessment as per MCI norms	05	05	05	03
Total marks	15	15	15	10

For Practical:

	Microbiology	Pharmacology	Pathology	FMT
III <sup>rd</sup> , IV <sup>th</sup> Sem. & Prelim Exam.	10	10	10	07
Day to day assessment as per MCI norms	05	05	05	03
Total marks	15	15	15	10

Ref: MGM/Patho/2016/0-424

To,

Date:14/12/16

The Registrar,  
MGMIHS,  
MGM Medical College,  
Navi Mumbai.

Subject: Submission of Final Revised Second MBBS syllabus.

Respected Sir,

Hereby submitting the final revised second MBBS syllabus and corrections have been done wherever needed.

Thanking You,

Yours faithfully,

*R Dhar*  
14/12/16

Dr. Reeta Dhar,  
Prof & HOD,  
Dept. of Pathology,  
MGM Medical college,  
Navi Mumbai.

*Recd*  
*[Signature]*  
17/12

MGM Institute Of Health Sciences  
INWARD NO. 9883  
DATE: 15/12/16  
REF: [Signature]

# PATHOLOGY (SYLLABUS)

## **I. Learning Objectives**

At the end of the course, the Student shall be able to,

1. Understand and describe the structure & ultra structure of a cell, the concept of cell injury, cell death, repair and the change produces thereby, in different tissues and organs.
2. Know the principles of collection, handling, storage, and dispatch of clinical samples from patient, in a pro per manner.
3. Perform and interpret in a proper manner the basic clinico-pathological procedures.
4. Knowledge of the common hematological disorders and the investigations necessary to diagnose them and determine their prognosis.
5. Understand normal haemostatic mechanism, the derangements of this mechanism and the effect on human system.
6. Understand the etiopathogenesis, the pathological effects, and the clinico-pathological correlation of common infectious and non-infectious diseases.
7. Understand the concept of neoplasia with respect to etiology, gross and microscopic features, diagnosis and prognosis in different tissues and organs of the body.
8. Correlate normal and altered morphology (gross and microscopy) of different organ systems in different diseases to the extent needed of understanding of the disease processes and their clinical significance.
9. Have knowledge of common immunological disorders and their effects on human body.

**II. Total number of teaching hours: 300hrs (IIIrd, IVth & Vth Semester)**

a)Theory	160 hrs
b)Practicals	110 hrs
c)Revisions & Evaluations (internal)	30 hrs
<b>Total</b>	<b>300hrs</b>

**III. Distribution of teaching hours:**

1) General Pathology	37 hrs
2) Hematology	16 hrs
3) Systemic Pathology	61 hrs
4) Clinical Pathology	03 hrs
6) Autopsy	01 hr
5) Tutorials, Integrated Teaching and Seminars	42 hrs
<b>Total</b>	<b>160hrs</b>

	Course Contents	Hrs	Must Know	Desirable to know	Nice to know
<b>General Pathology</b>					
<b>1</b>	<b>Cell injury</b>	<b>6hrs</b>			
	Common definitions in pathology and causes of cell injury.	1hr	√		
	Modes of cell injury: Mechanisms of cell injury	1hr	√		
	Reversible cell injury: Definitions, cellular swelling, fatty change.	1hr	√		
	Irreversible cell injury: Definition Necrosis & gangrene: definitions & types. Apoptosis & its relevance.	1hr	√		√
	Intracellular accumulations & alterations: Types of Intracellular accumulations with alterations in cell organelles & cytoskeleton.	1hr	√		
	Cellular adaptations & growth disturbances: Hypertrophy, Hyperplasia, Metaplasia, Agenesis, dysplasia.	1hr	√		
	Cellular ageing and mechanism				√
<b>2</b>	<b>Acute &amp; chronic Inflammation</b>	<b>3hrs</b>			
	Acute inflammation: Define & describe cellular & vascular changes. Outcomes & morphological patterns of acute inflammation.	1hr	√		
	Chemical mediators of inflammation: definition, classification, description of each type, role in acute & chronic inflammation.	1hr	√		
	Chronic inflammation: definition & causes.	1hr	√		
	Granulomatous inflammation: etiology, pattern & systemic effects of granulomas.				
<b>3</b>	<b>Regeneration &amp; repair</b>	<b>3hrs</b>			
	Regeneration & repair: define & describe mechanism of regeneration & repair.	1hr	√		
	Healing by primary & secondary intention with local & systemic factors affecting wound healing.	1hr	√		
	Repair in specialized tissue: Describe repair in fractures & parenchymal organs.	1hr	√		
	Stem cell concept-Regenerative medicine				√



<b>4</b>	<b>Circulatory disturbances</b>	<b>5hrs</b>			
	Hyperemia & congestion	1hr	√		
	Edema: Define, classify, pathogenesis & correlate morphology with clinical significance.	1hr	√		
	Thrombosis: Definition, etiopathogenesis, morphology, fate & effects of thrombosis.	1hr	√		
	Embolism & Infarction: Define types with clinical significance.	1hr	√		
	Shock: Define, classify, pathogenesis, mediators & stages of shock.	1hr	√		
<b>5</b>	<b>Genetic disorders</b>	<b>1hr</b>			
	Normal karyotype, classification of genetic disorders, types of genetic change.	1hr	√		
	Down's syndrome (Trisomy 21), Klinefelter's syndrome & Turner's syndrome.		√		
	Glycogen storage disease & lysosomal storage disorders.			√	
<b>6</b>	<b>Disturbances of pigment metabolism</b>	<b>1hr</b>			
	Types, changes associated with common disturbances like lipofuscin, Hemosiderin, melanin & Bilirubin.	1hr	√		
<b>7</b>	<b>Disturbances of Mineral metabolism</b>	<b>1hr</b>			
	Types & morphological changes in calcification.	1hr	√		
	Disturbance of mineral like zinc			√	
<b>8</b>	<b>Diseases of Immunity</b>	<b>4hrs</b>			
	Hypersensitivity reactions: Types & differentiate between different types of hypersensitivity reactions.	1hr	√		
	Transplant rejections			√	
	Autoimmune diseases: Mechanism of autoimmunity, common autoimmune diseases, SLE.	1hr	√		
	Amyloidosis: Definition, physical & chemical nature of amyloid, classification, pathogenesis, morphology, lab diagnosis with special stain & clinical correlation.	1hr	√		
	AIDS: Epidemiology, etiopathogenesis, morphology, clinical features, diagnosis, handling of infected materials & health education.	1hr	√		

9	<b>Infectious disease</b>	<b>7hrs</b>			
	<b>Typhoid fever:</b> Pathogenesis, morphology & clinical features.	1hr	√		
	<b>Syphilis:</b> Classify various stages, pathogenesis & morphology.	1hr	√		
	<b>Tuberculosis:</b> Epidemiology, etiology, pathogenesis, morphology, clinical features, lab diagnosis & importance of tuberculosis in the present day context.	2hr	√		
	<b>Leprosy:</b> Classify, pathogenesis, differentiate between different types of leprosy, histological features & sequelae.	1hr	√		
	<b>Fungal:</b> Classification of fungal diseases & opportunistic fungal infections.	1hr	√		
	<b>Parasitic:</b> Malaria: Types, morphological features in P. Vivax & Falciparum Malaria & lab diagnosis.	1hr	√		
	Leishmaniasis, Filariasis, Hydatid, Cysticercosis			√	
10	<b>Neoplasia</b>	<b>5 hrs</b>			
	Nomenclature, classification & differentiation between benign & malignant neoplasms.	1hr	√		
	Precancerous lesions.			√	
	Carcinogenesis	1hr	√		
	Tumor host interactions: Systemic effects & paraneoplastic syndromes.	1hr	√		
	Biology of tumor growth & Lab Diagnosis: Diagnostic workup including tumor markers.	1hr	√		
	Spread, grading & staging.	1hr	√		
	Molecular basis of cancer				√
	Tumor immunology				√
11	<b>Environmental Pathology</b>	<b>1hr</b>			
	Air pollution, Iatrogenic drug injury. Radiation & physical injury & Obesity, Tobacco & Alcoholism	1hr			√

	<b>Course Contents</b>	<b>Hrs</b>	<b>Must Know</b>	<b>Desirable to know</b>	<b>Nice to know</b>
<b>1</b>	<b>Hematopathology and transfusion medicine</b>	<b>16hrs</b>			
	Introduction to hematology & hemopoiesis	1hr	√		
	Anemia: classification and clinical features.	1hr	√		
	Nutritional anemia: Iron deficiency, Folic acid/ Vit B12 deficiency anemia including pernicious anemia.	2hr	√		
	Hemolytic anemia: Definition, classification, pathogenesis and investigations.	1hr	√		
	Hereditary spherocytosis and G6PD deficiency.			√	
	Haemoglobinopathies: Thalassemia, Sickle cell anemia.	1hr	√		
	Aplastic anemia	1hr	√		
	Hemorrhagic disorders: Classify and lab. Screening tests for hemorrhagic disorders. Platelet deficiency, ITP.	1hr		√	
	Coagulopathies: Coagulation factor deficiency, hemophilia, DIC.	1hr	√		
	Leucocytic disorders: Leucocytosis, leucopenia, Leukemoid reaction.	1hr	√		
	Acute leukemia: classification and diagnosis.	1hr	√		
	Chronic leukemia: classification and diagnosis.	1hr	√		
	Paraproteinemas: Multiple myeloma	1hr	√		
	Myelodysplastic syndromes and Myeloproliferative disorders	1hr		√	
	Blood groups and its relevance in transfusion medicine and hematology. Erythroblastosis foetalis.	1hr	√		
	Blood transfusion: Indications, selection of donor criteria, cross matching, untoward reactions, transmissible infections including HIV and hepatitis.	1hr	√		



	<b>Course Contents</b>	<b>Hrs</b>	<b>Must Know</b>	<b>Desirable to know</b>	<b>Nice to know</b>
	<b>Systemic Pathology</b>				
1	<b>Cardiovascular system</b>	<b>9hrs</b>			
	Hypertension & hypertensive heart disease	1hr	√		
	Atherosclerosis: Definition, etiopathogenesis, gross and microscopic features, complications and clinical correlation	1hr	√		
	Other diseases of blood vessels : Aneurysms Vasculitis	1hr	√	√	
	Ischemic heart disease: Categories and pathogenesis. Myocardial infarction : incidence, risk factors, pathogenesis, morphology, complications, clinical course and investigations	1hr	√		
	Rheumatic heart disease: Incidence, etiology, Pathogenesis, morphology, complications, clinical course & investigations.	1hr	√		
	Infective endocarditis: Causes, Pathogenesis, morphology, complications and differential diagnosis of cardiac vegetations.	1hr	√		
	Pericarditis and other pericardial diseases	1hr	√		
	Congenital heart disease: ASD, VSD, Fallot's teratology, Bicuspid aortic PDA	1hr		√	
	Cardiomyopathies	1hr		√	
2	<b>Respiratory system</b>	<b>7 hrs</b>			
	<b>Pneumonias:</b> Etiopathogenesis, classifications, morphology, clinical course and complications.	1hr	√		
	<b>Lung abscess:</b> Etiopathogenesis, Morphology and complications.	1hr	√		
	Atelectasis and hyaline membrane disease.			√	
	Chronic obstructive pulmonary disease: Bronchial asthma and Bronchiectasis -Etiopathogenesis, Morphology and complications.	1hr	√		
	Chronic bronchitis and Emphysema: Etiopathogenesis, Morphology types of emphysema and complications.	1hr	√		
	Pulmonary tuberculosis: primary and secondary, morphologic types including pleuritis, clinical course.	1hr	√		

	Occupational lung disorders: Anthracosis, silicosis, asbestosis, mesothelioma.	1 hr		√	
	Tumors of lung and pleura: Classification, etiopathogenesis, gross and microscopic features, pattern of spread, staging, clinical course, para- neoplastic syndromes.	1 hr	√		
3	<b>Oral cavity and salivary gland</b>	<b>2hrs</b>			
	Precancerous lesions of oral cavity and oral cancers: etiopathogenesis, gross and microscopic features.	1 hr	√		
	Differential diagnosis of swelling of salivary gland.	1 hr	√		
4	<b>Gastrointestinal tract</b>	<b>5hrs</b>			
	Gastritis: Etiology and types.	1 hr		√	
	Peptic ulcer: definition, etiopathogenesis, gross and microscopic features and complications.		√		
	Ulcers of intestine: etiological classifications, morphology of typhoid, tubercular, amoebic ulcers and bacillary dysentery. Differential diagnosis of different forms of ulcers.	1 hr	√		
	Idiopathic inflammatory bowel disease: etiopathogenesis, morphology and differences between Crohn's disease and ulcerative colitis.	1 hr	√		
	Appendicitis		√		
	Tumors of upper Gastrointestinal Tract: Esophagus: etiopathogenesis, morphology and clinical features. Gastric carcinoma: etiopathogenesis, classification, gross and microscopic features and clinical features. Carcinoid tumors of GIT.	1 hr	√		
	Tumors of lower Gastrointestinal Tract: Carcinoma colon- Etiopathogenesis, morphology and clinical features.	1 hr	√		
	Intestinal polyps and gastrointestinal stromal tumors.			√	
5	<b>Liver and Biliary Tract</b>	<b>5hrs</b>			
	Viral hepatitis: Etiopathogenesis, types, clinical source, pathology, serologic diagnosis, sequelae.	1 hr	√		
	Alcoholic liver disease: Pathogenesis, morphology and correlation with clinical features.	1 hr	√		
	Cirrhosis: Etiopathogenesis, classification, pathology, complications & differential diagnosis.	1 hr	√		
	Portal Hypertension: Types and manifestations.		√		

	Tumors of liver: Pathology of hepatocellular carcinoma.	1hr	√		
	Disease of gall bladder: cholecystitis, cholelithiasis and tumors.	1hr		√	
6	<b>Urinary tract system</b>	<b>8hrs</b>			
	Basics of impaired function and urinalysis	1hr	√		
	Nephritic and Nephrotic syndrome				
	Glomerulonephritis: Classification, Acute nephritis, rapidly progressive glomerulonephritis.	1hr	√		
	Renal failure: definitions, criteria, etiology, systemic manifestations and investigations.	1hr	√		
	Nephrolithiasis and obstructive nephropathy	1hr	√		
	Pyelonephritis and interstitial nephritis: etiopathogenesis of acute and chronic, morphology and clinical correlation.	1hr	√		
	Tumors of kidney and pelvis: classifications, morphology, clinical course and paraneoplastic syndromes of common tumors.	1hr	√		
	Renal vascular disorders and malformations, polycystic kidney.	1hr		√	
	Urinary bladder: cystitis and carcinoma	1hr	√		
7	<b>Female genital tract</b>	<b>6hrs</b>			
	Diseases of Uterus: Endometrial hyperplasia and carcinoma, adenomyosis, smooth muscle tumors	1hr	√		
	Trophoblastic diseases: hydatidiform mole, choriocarcinoma.	1hr		√	
	Diseases of cervix: cervicitis, cervical carcinoma, etiology cytological diagnosis	1hr	√		
	Ovarian tumors	1hr	√		
	Pelvic inflammatory disease including salpingitis	1hr	√		
	Genital tuberculosis			√	
	Breast: Non-neoplastic and Neoplastic lesions of the breast- Classification, Morphology, grading of carcinoma of breast and differential diagnosis of breast swellings.	1hr	√		



8	<b>Male Genital System</b>	<b>3hrs</b>			
	Prostate: Nodular hyperplasia, carcinoma	1 hr	√		
	Testicular tumors	1 hr	√		
	Carcinoma of penis	1 hr	√		
9	<b>Lymphoreticular system</b>	<b>3hrs</b>			
	Diseases of spleen: Splenomegaly and effects	1 hr		√	
	Lymphadenitis: Non-specific, granulomatous		√		
	Hodgkin's lymphoma, classification, morphology	1 hr	√		
	Non-Hodgkin's lymphoma, classification, morphology	1 hr	√		
10	<b>Dermatopathology</b>	<b>2hrs</b>			
	Skin tumors: Non-pigmented -classification and morphology.	1 hr	√		
	Skin tumors: pigmented- classification and morphological features of common nevi and malignant melanoma.	1 hr	√		
11	<b>Soft tissue</b>	<b>1hr</b>			
	Classification, morphological features of lipomatous, fibrous, blood vessels tumors, Neural, muscle and fibro histiocytic tumors.	1 hr	√		
12	<b>Skeletal System</b>	<b>3hrs</b>			
	Osteomyelitis and Metabolic diseases: rickets / osteomalacia, osteoporosis, hyperparathyroidism	1 hr		√	
	Tumors: Primary, osteosarcoma, osteoclastoma, Ewing's sarcoma, chondrosarcoma, metastatic	1 hr	√		
	Arthritis: rheumatoid, osteoid and tuberculosis	1 hr		√	
13	<b>Central Nervous system</b>	<b>3hrs</b>			
	CSF and its disturbances: Cerebral oedema, raised intracranial pressure	1 hr	√		
	Inflammatory disorders: Pyogenic and tuberculous meningitis, brain abscess, tuberculoma.		√		
	Cerebrovascular disease: atherosclerosis, thrombosis, embolism, aneurysm, hypoxia, infarction and haemorrhage	1 hr		√	
	Classify CNS tumors -primary glioma and meningioma and metastatic.	1 hr	√		



14	<b>Endocrine system</b>	<b>3hrs</b>			
	Thyroid: Differential diagnosis of thyroid nodule.	1hr	√		
	Adrenal diseases: Cortical hyperplasia, atrophy, tuberculosis, tumors of cortex and medulla.	1hr		√	
	Parathyroid hyperplasias and tumours , hyperparathyroidism. Pituitary tumors	1hr		√	
15	<b>Myopathies:</b> Differential diagnosis of common muscle disorders.	<b>1hr</b>		√	
	<b>Clinical Pathology</b>	<b>3hrs</b>			
1	Jaundice: Differential diagnosis and laboratory investigations in jaundice including Liver function.	1hr	√		
2	Diabetes mellitus: Classification, pathogenesis of system involvement, sequelae and complications.	1hr	√		
3	Renal function tests	1hr	√		
	<b>Medical Autopsy</b>	<b>1hr</b>			
1	Indications and techniques of medical autopsies	1hr	√		

**Tutorials , Seminars and Integrated teaching (42 Hours)**

<b>SR. No</b>	<b>TOPICS ( Tutorials &amp; Seminars )</b>	<b>HOURS</b>
1	Blood Collection and anticoagulant	1 hr
2	Peripheral Smear	1 hr
3	Iron deficiency Anemia	1 hr
4	Megaloblastic Anemia	1 hr
5	Hemolytic Anemia	1 hr
6	Erythrocyte sedimentation Rate ( ESR) & Packed Cell Volume (PCV)	1 hr
7	Leukemias	1 hr
8	Bone Marrow Examination	1 hr
9	Cell injury & Cell death	1 hr
10	Inflammation & Repair	1 hr
11	Circulatory Disturbances	1 hr
12	Neoplasia	1 hr
13	Pneumonias	1 hr
14	Cirrhosis	1 hr
15	Glomerulonephritis	1 hr
16	Ulcers of Gastrointestinal Tract	1 hr
17	Carcinoma Breast	1 hr
18	Carcinoma Cervix	1 hr
19	Bone tumors	1 hr
20	Liver function test & clinical charts	1 hr
21	Renal function test & clinical charts	1 hr
22	Gastric function test & clinical charts	1 hr
	<b>TOTAL</b>	<b>22hrs</b>

SR. No	TOPICS ( Integrated Teaching )	HOURS	SR. No
1	Auto immune disorders	Horizontal	2 hrs
2	Tuberculosis	Horizontal	2 hrs
3	Malaria	Horizontal	2 hrs
4	Urine Examination & UTI	Horizontal	2 hrs
5	HIV/AIDS	Vertical	2 hrs
6	Fungal Infection	Vertical	2 hrs
7	Typhoid	Vertical	2 hrs
8	Ischemic heart disease	Vertical	2 hrs
9	Rheumatic heart disease	Vertical	2 hrs
10	Meningitis	Vertical	2 hrs
	<b>TOTAL</b>		20hrs

**PRACTICAL:**

1. One – third of allotted practical hours to be devoted to
  - a. Performing a complete urine examination and detecting abnormalities and correlating with pathological changes.
  - b. To perform with accuracy and reliability basic hematological estimation: TLC DLC, peripheral smear, staining, reporting along with history.
2. One third of allotted practical hours to be devoted to  
Identify and interpret gross and microscopic features of inflammatory lesions of different organs and common systemic diseases.
3. One third of allotted practical hours to be devoted to  
Discussion of case studies (paper) clinical, gross and microscopic features and other parameters wherever applicable to learn clinico-pathological correlations.

**Practical Syllabus:**

<b>Clinical Pathology</b>	
1	Introduction to Pathology
2	Blood collection and anticoagulants
3	Hemoglobin estimation
4	Total WBC count
5	Differential WBC count
6	Development of blood & bone marrow examination.
7	Laboratory investigations in anemias :
8	Acute Leukemia
9	Chronic Leukemia
10	Blood grouping
11	Urine Examination
12	Examination of CSF
13	Bleeding disorders
14	Sputum and fluid tests
15	Renal function tests
16	Liver function tests
17	Gastric & Pancreatic function tests
18	Investigations in infertility

## General and Systemic Pathology

- 1 Microscope and microscopic study of cells and tissues
- 2 Retrogressive changes
- 3 Necrosis and Gangrene
- 4 Pigments
- 5 Amyloidosis
- 6 Acute inflammation
- 7 Chronic inflammation & repair
- 8 Typhoid & syphilis
- 9 Tuberculosis and Leprosy
- 10 Circulatory disturbances I, II & III
- 11 Disorders of cell growth
- 12 Tumor Pathology I & II
- 13 Immuno Pathology I & II
- 14 Respiratory System I & II
- 15 Cardiovascular System I & II
- 16 Alimentary System I, II & III
- 17 Hepatobiliary System I & II
- 18 Diseases of Kidney I & II
- 19 Female reproductive System
- 20 Male reproductive System
- 21 Lymph nodes and Spleen
- 22 Skeletal System
- 23 Diseases of Skin
- 24 Central nervous System
- 25 Tumors of Breast and Diseases of the endocrine organs



## EXAMINATION SKILLS

1. Be able to collect, store and transport materials for various pathological tests including histopathology, cytopathology, clinical pathology, hematology and biochemistry.
2. Interpret abnormal laboratory values of common diseases
3. Do complete urine examination including microscopy.
4. Do perform and interpret hemoglobin, TLC, DLC, ESR, PCV, peripheral blood smears and red cell morphology.
5. Interpret the peripheral smears of common diseases.
6. Do blood grouping and cross matching
7. Adapt universal precautions for self protection against HIV and hepatitis and counsel the patient.

### Semester / Term Ending Theory and Practical Examination in Pathology

Semester	Theory Marks	Practical Marks
III	40	40
IV	40	40
V	80	40
<b>Total</b>	<b>160</b>	<b>120</b>

There will be single theory paper at the end of each semester. The pattern for theory & Practical examination will be same as **Pathology University Examination**.

#### **Pathology University Examination: Theory, Practicals and Viva**

1. Scheme of internal assessment (Pathology) : The computation of internal assessment marks shall be as per university rule and regulations.
2. Pattern of Theory Examination including Distribution of Marks, Questions and Time.

##### Distribution of Marks

Sr. No		Total marks
1	Theory ( 2 papers - 40 marks each)	80
2	Oral (Viva)	15
3	Practical	25
4	Internal assessment ( Theory -15, Practicals -15)	30
	<b>Total</b>	<b>150</b>

- i) Total duration - 4 hrs (each paper of 2 hrs or 120 minutes)
- ii) Each paper will have 3 sections.
- iii) Pattern and marking for each paper of 40 marks as provided in the table

Sections	Nature of Question- Two Theory Papers	Total No. of Questions	Mark (s) per Question	Total Marks
A)	Multiple Choice Questions (MCQs)	16	1/2	08
B)	Brief Answer Questions (BAQs)	4 out of 5	4 x 4	16
C)	Long Answer Question (LAQ)	2 out of 3	2 x 8	16
<b>Total</b>				<b>40</b>

**3. Direction- For paper setting**

LAQs and MCQs must be from must know area.

SAQs must be from, Must know (90% ), Desirable to know & Nice to know ( 10%)

**Paper wise distribution of theory topics and number of questions:**

**A) Paper I:**

**General Pathology inclusive of general neoplasia, Haematology inclusive of transfusion medicine.**

Out of the total 16marks for MCQs in section A, 10 MCQs should be from General Pathology inclusive of general neoplasia, 4 MCQs from hematology and 2 MCQs from transfusion medicine.

Out of 3 LAQs in Section C, 2 questions should be from General Pathology and General Neoplasia and one question should be from Haematology inclusive of transfusion medicine.

**B) Paper II:**

**Systemic Pathology inclusive of Systemic Neoplasia and Clinical Pathology.**

Out of the total 16 marks for MCQs in section A, 12 MCQs should be from systemic pathology inclusive of systemic neoplasia and 4 MCQs from clinical pathology.

Out of 3 LAQs in Section C, 2 questions should be from Systemic Pathology and Systemic Neoplasia and one question should be from Clinical Pathology.

**4. Marking scheme:** Each paper of 40 marks as shown in the above table.

**5. University examination Nature of practicals and duration (Pathology)**

a) Number of students for practical Examination should not exceed more than 35 /day.

**b) Practical**

**Marks 25**

	<b>Practicals</b>		<b>Marks</b>
a.	10 Spots (2 minutes each)	4 specimens, 3 histopathology slides, 1 hematology slide, 1 instrument and 1 chart  Identification – 1/2 mark Specific short question - 1/2 mark 1 Mark for each spot	10 Marks
b.	Urine Examination	Physical Examination and two abnormal constituents.	05 Marks
c.	Histopathology slide	Draw, label and give diagnosis.	03 Marks
d.	Haematology Examination	Peripheral blood smear staining and do differential leukocyte count.	03 Marks
		Hemoglobin Estimation / Total leukocyte count / Blood group Estimation.	04 Marks
		<b>Total</b>	<b>25 Marks</b>

**C) Viva: Duration and topic distribution: Viva marks shall be added to theory and shall be submitted separately out of 15 Marks.**

**Viva consists of two tables; on each table the student will face 2 examiners for 5 minutes each:**

Table - I General and Systemic Pathology

7 Marks

Table - II Clinical Pathology and Haematology

8 Marks

<b>Total 15 Marks</b>
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#### **TEACHING LEARNING METHODS:**

- Structured interactive sessions
- Small group discussion
- Practical including demonstrations
- Problem based exercises
- Self learning tools
- Interactive learning
- E-modules

#### **LEARNING RESOURCE MATERIALS:**

- Text books
  - 1) Robbin's : Pathologic basis of Disease
  - 2) Hematology De Gruchy
  - 3) Text book of Pathology by Harsh Mohan
  - 4) Clinical Pathology: A Practical Manual by Sabitri Sanyal
  - 5) Practical Pathology Book by Harsh Mohan
- Reference books
  - 1) Dacie and Lewis practical Hematology; 12<sup>th</sup> Edition.
  - 2) Pathology illustrated; 7<sup>th</sup> Edition by Robin Reid.
  - 3) Henry's Clinical diagnosis & Management By Laboratory Methods; 23<sup>rd</sup> Edition, by Richard McPherson.
  - 4) Transfusion Medicine, Technical Manual.2<sup>nd</sup> Edition 2003 , Edited by R. K. Saran.

#### **TIME OF EVALUATION:**

There should be regular formative assessment. Formative assessment, day to day performance should be given greater importance. Examination of pathology should be at the end of 5<sup>th</sup> semester and formative assessment in middle of 3<sup>rd</sup> and 4<sup>th</sup> semester and summative assessment at the end of 5<sup>th</sup> semester.

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**MGM INSTITUTE OF HEALTH SCIENCES**  
(Deemed University u/s 3 of UGC Act, 1956)

**MARKLIST FOR PRACTICAL AND VIVA**

EXAM CENTRE: - ..... EXAM: - SECOND MBBS

SUBJECT: -PATHOLOGY MONTH / YEAR: -.....

**DISTRIBUTION OF PRACTICAL MARKS**

- A: 10 spots 2 minutes each (4 Specimen, 1 Instrument, 3 histopathology slides, 1 hematology slide and 1 chart)  
½ marks for identification and ½ mark for specific short question together 1 mark for each spot. - 10 Marks
- B : Urine Examination - 05 Marks
- C : Histopathology Slides - 03 Marks

**HAEMATOLOGY EXAMINATION**

- D : Peripheral Blood Smear Stain And Report - 03 Marks
- E: Hb/TLC/ Blood group - 04 Marks
- F: Total - 25 Marks

**DISTRIBUTION OF VIVA MARKS**

- G: General of Systematic Pathology - 07 Marks
- H: Clinical Patho and Hematology - 08 Marks
- I : Total - 15 Marks

Seat No	A	B	C	D	E	F Practical Total 25 Max. 25 Marks Min. 12.5 Marks	G	H	Viva Total.
		10	5	3	3	4	25 Marks	07	08

NAME OF EXAMINER	COLLEGE	SIGNATURE WITH DATE
1.		
2.		
3.		
4.		



**MGM Medical College**  
**Modal Question Paper**  
**IInd MBBS**

**Subject: Pathology**

**PAPER -I**

**Date:**

**Duration: 2hrs**

**Maximum Marks : 40**

**Section A: 15mins**

**Instructions:**

1. All questions are compulsory.
  2. Please darken the correct box in an answer sheet.
- 

**SECTION 'A' (MCQ's)**

**16x0.5 = 8Marks**

- 1) Bouin's fluid contains all except
  - a) Picric acid
  - b) Glacial acetic acid
  - c) Formalin
  - d) Methanol
  
- 2) Tissue sections are cut by an instrument called as
  - a) Thermometer
  - b) Cryostat
  - c) Microtome
  - d) Autotechnicon
  
- 3) Masson's trichrome stain is used for
  - a) Fat
  - b) Mucin
  - c) connective tissue
  - d) Pigment
  
- 4) Coagulative necrosis is seen in all of the following conditions except
  - a) Myocardial infarction
  - b) Thermal injury
  - c) Tuberculosis of lung
  - d) Kidney infarction
  
- 5) Gangrene of intestine is an example of
  - a) Dry Gangrene
  - b) Wet Gangrene
  - c) Gas Gangrene
  - d) Air embolism
  
- 6) Reversible cell injury does not show
  - a) Loss of microvilli
  - b) Karyolysis
  - c) Endoplasmic reticulum swelling
  - d) Myelin figures

- 7) Caisson disease is due to
- a) Fat embolism
  - b) Air embolism
  - c) Amniotic fluid embolism
  - d) Thromboembolism
- 8) Release of lipopolysaccharide in the body leads to:
- a) Cardiogenic shock
  - b) Septic shock
  - c) Hypovolemic shock
  - d) Neurogenic shock
- 9) In clean surgical wound, granulation tissue appears by
- a) 24hrs
  - b) one week
  - c) 3 days
  - d) 5days
- 10) In acute inflammation ,the tissue response consists of all except
- a) Exudation
  - b) Vasodilation
  - c) Neutrophilic response
  - d) Macrophage accumulation
- 11) All of the following investigations are done to diagnose iron deficiency anaemia except
- a) Serum iron level
  - b) Serum ferritin level
  - c) Folic acid level
  - d) Total iron binding capacity
- 12) 1% sodium metabisulfite is used in
- a) Sickling Test
  - b) Shilling's Test
  - c) Folic acid level
  - d) Total iron binding capacity
- 13) All of the following are the abnormalities in the shape of erythrocyte EXCEPT
- a) Ovalocyte
  - b) Elliptocyte
  - c) Spherocyte
  - d) Reticulocyte
- 14) Following are the causes of iron deficiency anaemia EXCEPT
- a) Hookworm infestation
  - b) Carcinoma of the stomach
  - c) Nutritional deficiency
  - d) Intrinsic factor deficiency
- 15) In Blood bag Adenine is added to CPD to
- a) Increase Shelf – life
  - b) Prevent Coagulation of blood
  - c) Prevent Growth of microorganisms
  - d) All of above
- 16) Bombay phenotype are the individuals who:
- a) Lack H genes and therefore H substance
  - b) Lack C, D, E antigens
  - c) Secrete excessive amount of H substance
  - d) Possess A, B antigens

**MGM Medical College  
Modal Question Paper  
IInd MBBS**

**Subject: Pathology**

**PAPER -I**

**Date:**

**Duration: 2hrs**

**Maximum Marks: 40**

**Section B& C: 1hr 45mins**

**Instructions:**

- 1. All questions are compulsory.**
  - 2. Draw neat and labelled diagram wherever necessary.**
- 

**Section – B**

**Q 2) Write short answers (Any 4 out of 5)**

**4 x 4 = 16**

- 1) Difference between dry and wet gangrene. ( Must Know)
- 2) Repair of fracture bone.( Must Know)
- 3) Down syndrome ( Must Know)
- 4) Hereditary spherocytosis. ( Desirable to Know)
- 5) Transfusion reactions. ( Must Know)

**Section – C**

**Q3) Write Long answers (Any 2 out of 3)**

**2 x 8 = 16**

1. Define inflammation. Write in detail about vascular and cellular events in acute inflammation. ( Must Know)
  2. Define carcinogens and discuss chemical carcinogenesis. ( Must Know)
  3. Classify anemias and discuss laboratory investigations in megaloblastic anaemia. ( Must Know)
-

**MGM Medical College  
Modal Question Paper  
IInd MBBS**

**Subject: Pathology**

**PAPER -II**

**Date:**

**Duration: 2hrs**

**Maximum Marks: 40**

**Section B& C: 1hr 45mins**

**Instructions:**

- 1. All questions are compulsory.**
- 2. Draw neat and labelled diagram wherever necessary.**

**Section – B**

**Q 2) Write short answers (Any 4 out of 5)**

**4 x 4 = 16**

1. Peptic ulcer. ( Must Know)
2. Hepatocellular carcinoma ( Must Know)
3. Vesicular mole ( Desirable to Know)
4. Post streptococcal Glomerulonephritis. ( Must Know)
5. Difference between pyogenic and tuberculous meningitis. ( Must Know)

**Section – C**

**Q3) Write Long answers (Any 2 out of 3)**

**2 x 8 = 16**

1. Discuss etiopathogenesis, gross and microscopic features of myocardial infarction. ( Must Know)
  2. Classify lung tumours and discuss in details about bronchogenic carcinoma ( Must Know)
  3. Classify Diabetes mellitus. Discuss laboratory investigations and complications of diabetes mellitus. ( Must Know)
-



**MGM Medical College**  
**Modal Question Paper**  
**IInd MBBS**

**Subject: Pathology**

**PAPER -II**

**Date:**

**Duration: 2hrs**

**Maximum Marks : 40**

**Section A: 15mins**

**Instructions:**

1. All questions are compulsory.
  2. Please darken the correct box in an answer sheet.
- 

**SECTION 'A' (MCQ's)**

**16x0.5 = 8Marks**

- 1) Septic vegetations are seen in
  - a) Bacterial endocarditis
  - b) Hypercoagulable stat
  - c) SLE
  - d) RHD
  
- 2) The presence of endometrial glands or stroma in abnormal locations outside the uterus is termed as
  - a) Endometritis
  - b) Endometriosis
  - c) Endometrial hiperplasia
  - d) Adenomyosis
  
- 3) Atelectasis is
  - a) Loss of lung Volume
  - b) Loss of lung Lobe
  - c) Loss of lung Lobule
  - d) All of above
  
- 4) 'Leather bottle stomach' results from which type of carcinoma stomach?
  - a) Fungating type
  - b) Polypoidal type
  - c) Diffuse infiltrating type
  - d) Ulcerative type
  
- 5) Mallory hyaline bodies are seen in
  - a) Viral Hepatitis
  - b)Autoimmune Hepatitis
  - c) Alcoholic hepatitis
  - d)Drug induced hepatitis
  
- 6) On X ray onion skin appearance is characteristic of
  - a) Osteogenic sarcoma
  - b) Fibrosarcoma
  - c) Ewings sarcoma
  - d) Giant cell tumour

- 7) Hodgkins lymphoma is classified into all of the following except
- a) Nodular sclerosis
  - b) Mixed cellularity type
  - c) Diffuse large cell type
  - d) Lymphocyte predominance type
- 8) Premalignant conditions of GIT are
- a) Familial Polyposis Coli
  - b) Villous adenoma
  - c) Ulcerative Colitis
  - d) All of the above
- 9) Nephrotic syndrome includes all of the following EXCEPT
- a) Heavy Proteinuria
  - b) Hypoalbuminemia
  - c) Lipiduria
  - d) Hematuria
- 10) Following are the type of germ cell tumours except
- a) Seminoma
  - b) Embryonal carcinoma
  - c) Granulosa cell tumour
  - d) Choriocarcinoma
- 11) Leiomyomas are commonly seen in
- a) Women after menopause
  - b) Women during active reproductive life
  - c) Prepubertal age
  - d) Elderly women
- 12) All of the following are true about chronic pyelonephritis EXCEPT
- a) Significant bacteriuria is not found
  - b) Involvement of the kidney is bilateral and symmetric
  - c) Chronic pyelonephritis associated with reflux nephritis exhibit acute recur pyelonephritis
  - d) Appearance of proteinuria and focal segmental sclerosis indicate bad prognosis
- 13) One of the following crystal is found in alkaline urine
- a) Uric acid
  - b) Triple phosphate
  - c) Oxalate
  - d) Cystine
- 14) All of the following sugars are detected by benedicts test except
- a) Galactose
  - b) Maltose
  - c) Lactose
  - d) Sucrose
- 15) For the diagnosis of early diabetic nephropathy urine is tested for
- a) B J Protiens
  - b) Ketone bodies
  - c) Urobilinogen
  - d) Microalbuminuria
- 16) Kimmelstiel Wilson lesion in the glomeruli are seen in
- a) S L E
  - b) Amyloidosis
  - c) Diabetes Mellitus
  - d) Bacterial endocarditis
-



**MGM Medical College  
Modal Question Paper  
IInd MBBS**

**PAPER -II**

**Subject: Pathology**

**Date:**

**Duration: 2hrs**

**Maximum Marks: 40**

**Section B & C: 1hr 45mins**

**Instructions:**

- 1. All questions are compulsory.**
- 2. Draw neat and labelled diagram wherever necessary.**

**Section – B**

**Q 2) Write short answers (Any 4 out of 5)**

**4 x 4 = 16**

1. Peptic ulcer.
2. Hepatocellular carcinoma
3. Vesicular mole
4. Post streptococcal Glomerulonephritis.
5. Difference between pyogenic and tuberculous meningitis.

**Section – C**

**Q3) Write Long answers (Any 2 out of 3)**

**2 x 8 = 16**

1. Discuss etiopathogenesis, gross and microscopic features of myocardial infarction.
  2. Classify lung tumours and discuss in details about bronchogenic carcinoma.
  3. Classify Diabetes mellitus. Discuss laboratory investigations and complications of diabetes mellitus.
-

**Resolution No. 1.3.7.1 of BOM-51/2017:** Resolved to continue the current Internal Assessment pattern for MBBS (i.e. 5 marks for Day-to-day assessment) for Pre and Para Clinical subjects (Anatomy, Physiology, Biochemistry, Microbiology, Pharmacology, Pathology and FMT). For rest of the subjects, Internal Assessment is to be calculated from terminal/Post end exam marks and Prelims examination, with immediate effect.

**Resolution No. 1.3.8.8 of BOM-51/2017: Resolved to:**

- (i) Introduce problem case discussion (problem based learning) in all para-clinical subjects on topics identified from batch entering in II<sup>nd</sup> MBBS in 2017-18 onwards. Annexure-VI

Problem based learning topics for undergraduates (MBBS)

2. Pathology

- Diabetes Mellitus
- Anaemias – a) Iron Deficiency, b) Megaloblastic c) Hemolytic
- Hepatitis

**Resolution No. 1.3.8.13 of BOM-51/2017:** Resolved to approve the topics for vertical and horizontal integrated teaching in II<sup>nd</sup> MBBS Curriculum from batch entering in II<sup>nd</sup> MBBS in 2017-18 onwards. **Annexure-XI**

## Pathology

### 1. Topics for Integrated Teaching (Horizontal)

1	Auto immune disorders	Horizontal
2	Tuberculosis	Horizontal
3	Malaria	Horizontal
4	Urine Examination & UTI	Horizontal
<b>Topics for Integrated Teaching (Vertical)</b>		
5	HIV/AIDS	Vertical
6	Fungal Infection	Vertical
7	Typhoid	Vertical
8	Ischemic heart disease	Vertical
9	Rheumatic heart disease	Vertical
10	Meningitis	Vertical

**Resolution No. 1.3.8.11 of BOM-51/2017:** Resolved to approve the topics to be included under Bioethics in UG. **[Annexure-IX]**

## Bioethics Topics for UG/PG

### Topics for II-MBBS Pathology Syllabus

1. Blood Transfusion.
2. Integrity

**Resolution No. 3.5.9 of BOM-52/2018:**

- a) BOM reiterated the earlier BOM resolution as mentioned below:

**Resolution No. 1.3.7.5 of BOM-51/2017:** It was resolved that

- i) In all the subjects of all courses, MCQ weightage (Section A) shall be a maximum of 20% of the total marks in each paper.
- ii) BOS will have to accordingly workout the changes in Section B & C weightage and put up in forthcoming BOS meeting.
- iii) Further University Examination section must validate the MCQ Question Bank by Faculties before giving it to question paper-setter.

- b) To be effective from:

- (i) Ist MBBS - Batch appearing in University August/September 2018 examination onwards.
- (ii) IInd MBBS - Batch appearing in University January 2019 examination onwards.
- (iii) IIIrd MBBS (Part I) and IIIrd MBBS (Part II) - Batch appearing in University January 2019 examination onwards.



**Resolution No. 4.2.1 of BOM-53/2018:** Resolved that the printed format of the Medico-legal examination proforma (sexual violence) may be provided to 2<sup>nd</sup> MBBS students during practical's in formative and summative assessments [**Annexure-X**], to be applicable from batch entering into 2<sup>nd</sup> MBBS 2017-18 onwards.

Annexure 30 for item NO. ④

Annexure - X

CONFIDENTIAL

Medico-legal Examination Report of Sexual Violence

1. Name of the Hospital ..... OPD No. .... Inpatient No .....
2. Name . . . . . D/o or S/o (where known).....
3. Address.....
4. Age (as reported) ..... Date of Birth (if known).....
5. Sex (M/F/Others) .....
6. Date and Time of arrival in the hospital .....
7. Date and Time of commencement of examination.....
8. Brought by..... (Name & signatures)
9. MLC No. .... Police Station. ....
10. Whether conscious, oriented in time and place and person ✓.....
11. Any physical/intellectual/psychosocial disability .....

(Interpreters or special educators will be needed where the survivor has special needs such as hearing/speech disability, language barriers, intellectual or psychosocial disability.)

12. Informed Consent/refusal

I..... D/o or S/o.....

hereby give my consent for:

- |  |                              |                             |
|--|------------------------------|-----------------------------|
| a) medical examination for treatment                     | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| b) this medico legal examination                         | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| c) sample collection for clinical & forensic examination | Yes <input type="checkbox"/> | No <input type="checkbox"/> |

I also understand that as per law the hospital is required to inform police and this has been explained to me.

I want the information to be revealed to the police Yes  No

I have understood the purpose and the procedure of the examination including the risk and benefit, explained to me by the examining doctor. My right to refuse the examination at any stage and the consequence of such refusal, including that my medical treatment will not be affected by my refusal, has also been explained and may be recorded. Contents of the above have been explained to me in ..... language with the help of a special educator/interpreter/support person (circle as appropriate) .....

If special educator/interpreter/support person has helped, then his/her name and signature.....

2

Name & signature of survivor or parent/Guardian/person in whom the child reposes trust in case of child (<12 yrs)

.....  
.....  
.....

With date, time & place  
Name & signature/thumb impression of Witness

.....  
.....  
..... ✓

With Date, time and place

13. Marks of identification (Any scar/mole)

(1) .....  
(2) .....



Left Thumb impression

14. Relevant Medical/Surgical history

Onset of menarche (in case of girls)	Yes	No	Age of onset.....
Menstrual history - Cycle length and duration	..... Last menstrual period.....		
Menstruation at the time of Incident -	Yes/	No,	Menstruation at the time of examination - Yes/ No
Was the survivor pregnant at time of incident -	Yes/No, If yes duration of pregnancy ..... weeks		
Contraception use: Yes/No.....	If yes - method used: .....		
Vaccination status - Tetanus (vaccinated/not vaccinated), Hepatitis B (vaccinated/not vaccinated)	.....		

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15 C.

- i. Emotional abuse or violence if any (insulting, cursing, belittling, terrorizing).....
- ii. Use of restraints if any .....
- iii. Used or threatened the use of weapon(s) or objects if any.....
- iv. Verbal threats (for example, threats of killing or hurting survivor or any other person in whom the survivor is interested; use of photographs for blackmailing, etc.) if any: .....
- v. Luring (sweets, chocolates, money, job) if any: .....
- vi. Any other:.....

15 D.

- i. Any H/O drug/alcohol intoxication: .....
- ii. Whether sleeping or unconscious at the time of the incident: .....

15 E. If survivor has left any marks of injury on assailant/s, enter details: .....

15 F. Details regarding sexual violence:

Was penetration by penis, fingers or object or other body parts (Write Y=Yes, N=No, DNK=Don't know) Mention and describe body part/s and/or object/s used for penetration.

Orifice of Victim	Penetration			Emission of Semen		
	By Penis	By body part of self or assailant or third party (finger, tongue or any other)	By Object	Yes	NO	Don't know
Genitalia (Vagina and/or urethra)						
Anus						
Mouth						

Oral sex performed by assailant on survivor	Y	N	DNK
Forced Masturbation of self by survivor	Y	N	DNK
Masturbation of Assailant by Survivor, Forced Manipulation of genitals of assailant by survivor	Y	N	DNK
Exhibitionism (perpetrator displaying genitals)	Y	N	DNK
Did ejaculation occur outside body orifice (vagina/anus/mouth/urethra)?	Y	N	DNK

5

If yes, describe where on the body			
Kissing, licking or sucking any part of survivor's body	Y	N	If Yes, describe
Touching/Fondling	Y	N	If Yes, describe
Condom used*	Y	N	DNK
If yes status of condom	Y	N	DNK
Lubricant used*	Y	N	DNK
If yes, describe kind of lubricant used			
If object used, describe object:			
Any other forms of sexual violence			

\* Explain what condom and lubricant is to the survivor

Post Incident has the survivor	Yes/No/Do Not know	Remarks
Changed clothes		
Changed undergarments		
Cleaned/washed clothes		
Cleaned/washed undergarments		
Bathed		
Douched		
Passed urine		
Passed stools		
Rinsing of mouth/Brushing/ Vomiting (Circle any or all as appropriate)		

Time since incident ..... H/o vaginal/anal/oral bleeding/discharge prior to the incident of sexual violence .....

H/o vaginal/anal/oral bleeding/discharge since the incident of sexual violence .....

H/o painful urination/ painful defecation/ fissures/ abdominal pain/pain in genitals or any other part since the incident of sexual violence

16. General Physical Examination-

- i. Is this the first examination .....
- ii. Pulse ..... BP .....
- iii. Temp. .... Resp. Rate .....
- iv. Pupils .....
- v. Any observation in terms of general physical wellbeing of the survivor .....

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17. Examination for Injuries on the body if any

The pattern of injuries sustained during an incident of sexual violence may show considerable variation. This may range from complete absence of injuries (more frequently) to grievous injuries (very rare).

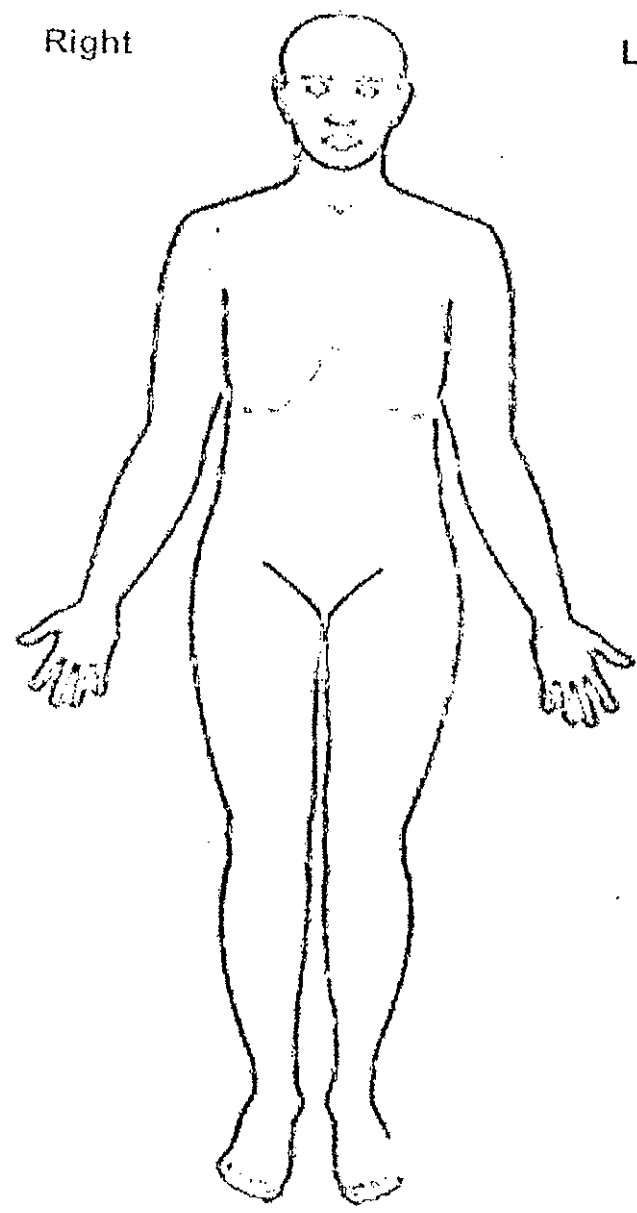
(Look for bruises, physical torture injuries, nail abrasions, teeth bite marks, cuts, lacerations, fracture, tenderness, any other injury, boils, lesions, discharge specially on the scalp, face, neck, shoulders, breast, wrists, forearms, medial aspect of upper arms, thighs and buttocks) Note the Injury type, site, size, shape, colour, swelling signs of healing simple/grievous, dimensions.)

Scalp examination for areas of tenderness (if hair pulled out/ dragged by hair)	
Facial bone injury: orbital blackening, tenderness	
Petechial haemorrhage in eyes and other places	
Lips and Buccal Mucosa / Gums	
Behind the ears	
Ear drum	
Neck, Shoulders and Breast	
Upper limb	
Inner aspect of upper arms	
Inner aspect of thighs	
Lower limb/Buttocks	
Other, please specify	

7

Right

Left

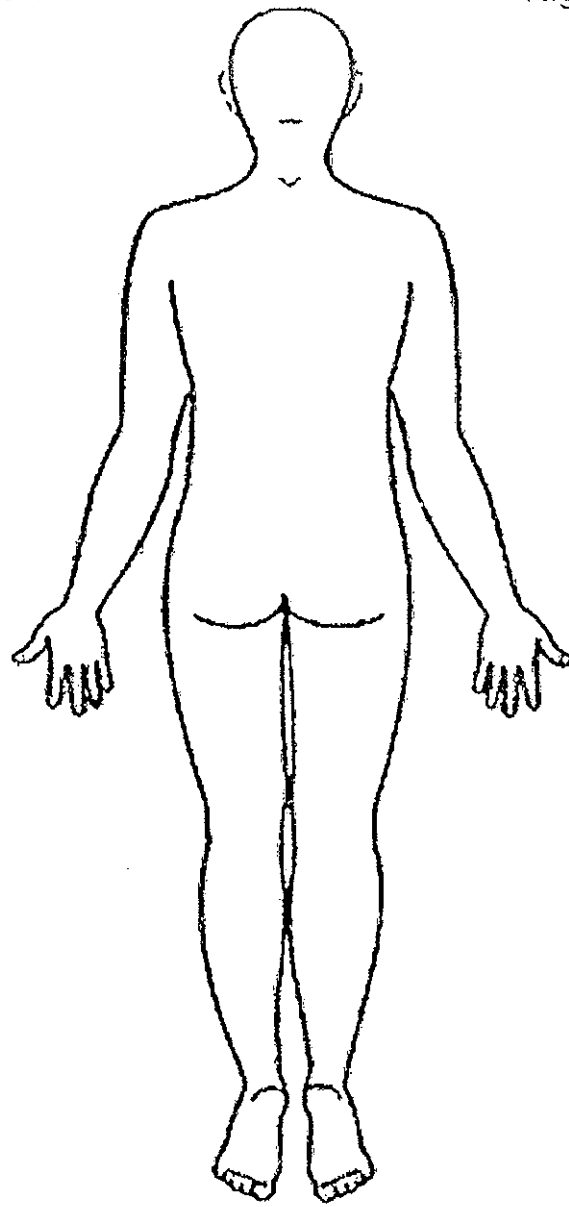


37

8

Left

Right



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18. Local examination of genital parts/other orifices\*:

A. External Genitalia: Record findings and state NA where not applicable.

Body parts to be examined	Findings	
Urethral meatus & vestibule		
Labia majora		
Labia minora		
Fourchette & Introitus		
Hymen Perineum		
External Urethral Meatus		✓
Penis		
Scrotum		
Testes		
Clitoropenis		
Labioscrotum		
Any Other		

\* Per/Vaginum /Per Speculum examination should not be done unless required for detection of injuries or for medical treatment.

P/S findings if performed .....

P/V findings if performed .....

Record reasons if P/V of P/S examination performed .....

C. Anus and Rectum (encircle the relevant)

Bleeding/tear/dischage/oedema/tenderness

D. Oral Cavity - (encircle the relevant)

Bleeding/dischage/tear/oedema/tenderness

19. Systemic examination:

Central Nervous System: .....

Cardio Vascular System: .....

Respiratory System: .....

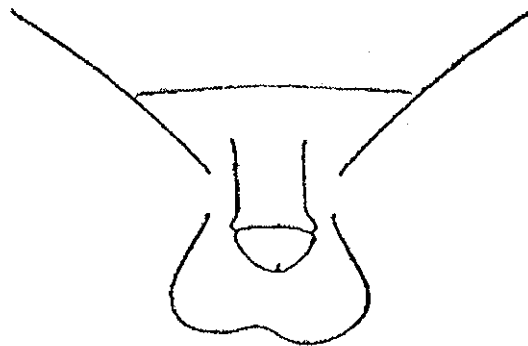
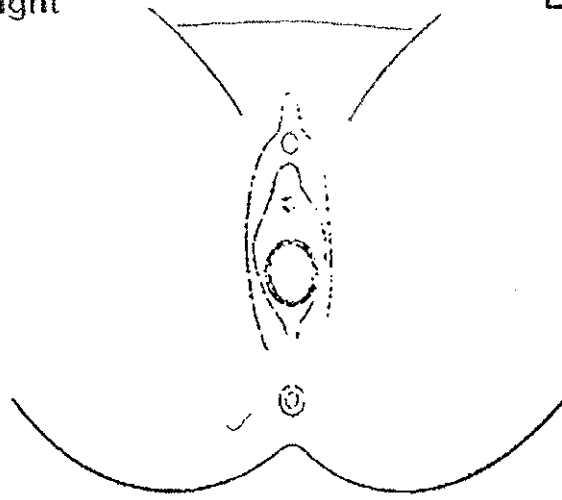
Chest: .....

Abdomen: .....

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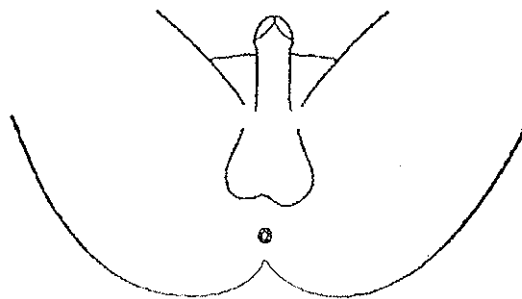
Right

Left



Right

Left



40

11

20. Sample collection/investigations for hospital laboratory/ Clinical laboratory

- 1) Blood for HIV, VDRL, HbsAg
- 2) Urine test for Pregnancy/
- 3) Ultrasound for pregnancy/internal injury
- 4) X-ray for Injury

21. Samples Collection for Central/ State Forensic Science Laboratory

- 1) Debris collection paper
- 2) Clothing evidence where available – (to be packed in separate paper bags after air drying)

List and Details of clothing worn by the survivor at time of incident of sexual violence

✓

3) Body evidence samples as appropriate (duly labeled and packed separately)

	Collected/Not Collected	Reason for not collecting
Swabs from Stains on the body (blood, semen, foreign material, others)		
Scalp hair (10-15 strands)		
Head hair combing		
Nail scrapings (both hands separately)		
Nail clippings (both hands separately)		
Oral swab		
Blood for grouping, testing drug/alcohol intoxication (plain vial)		
Blood for alcohol levels (Sodium fluoride vial)		
Blood for DNA analysis (EDTA vial)		
Urine (drug testing)		
Any other (tampon/sanitary napkin/condom/object)		

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4) Genital and Anal evidence (Each sample to be packed, sealed, and labeled separately-to be placed in a bag)

\* Swab sticks for collecting samples should be moistened with distilled water provided.

	Collected/Not Collected	Reason for not collecting
Matted pubic hair		
Pubic hair combing (mention if shaved)		
Cutting of pubic hair (mention if shaved)		
Two Vulval swabs (for semen examination and DNA testing)		
Two Vaginal swabs (for semen examination and DNA testing)		
Two Anal swabs (for semen examination and DNA testing)		
Vaginal smear (air-dried) for semen examination		
Vaginal washing		
Urethral swab		
Swab from glans of penis/clitoris		

\*Samples to be preserved as directed till handed over to police along with duly attested sample seal.

22. Provisional medical opinion

I have examined (name of survivor).....M/F/Other.....aged..... reporting\_ (type of sexual violence and circumstances)....., XYZ days/hours after the incident, after having (bathed/douched etc)..... My findings are as follows:

- Samples collected (for FSL), awaiting reports
- Samples collected (for hospital laboratory)
- Clinical findings
- Additional observations (if any)

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23. Treatment prescribed:

Treatment	Yes	NO	Type and comments
STI prevention treatment			
Emergency contraception			
Wound treatment			
Tetanus prophylaxis			
Hepatitis B vaccination			
Post exposure prophylaxis for HIV			
Counselling			
Other			

24. Date and time of completion of examination .....

This report contains ..... number of sheets and ..... number of envelopes.

Signature of Examining Doctor

Name of Examining Doctor

Place:

Seal

25. Final Opinion (After receiving Lab reports)

Findings in support of the above opinion, taking into account the history, clinical examination findings and Laboratory reports of ..... bearing identification marks described above, ..... hours/ days after the incident of sexual violence, I am of the opinion that:

Signature of Examining Doctor

Name of Examining Doctor

Place:

Seal

COPY OF THE ENTIRE MEDICAL REPORT MUST BE GIVEN TO THE SURVIVOR/ VICTIM FREE OF COST IMMEDIATELY

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**Resolution No. 4.3.5 of BOM-53/2018:** Resolved to add reference book entitled “ESSENTIAL IN RESPIRATORY MEDICINE” by Dr. S.H. Talib in the UG/PG curriculum in medicine and allied subjects

**Resolution No. 4.5.2.1 of BOM-55/2018:** Resolved to introduce training in 'Research Methodology' for 3<sup>rd</sup> Semester MBBS students entering in 3<sup>rd</sup> Semester from September 2018 onwards. It was further resolved that responsibility of this training will be with Pharmacology department.

**Resolution No. 4.5.2.3 of BOM-55/2018:** Resolved to provide the printed standard format of the Medico-legal examination (Age,Alcoholic, Weapon,Injury,Death,Potency,Sickness,Fitness) to 2<sup>nd</sup> MBBS students during practical examination in formative and summative assessments. [Annexure-34-A,B,C,D,E,F,G,H]

Recd. on 18/11/2018

**Examination for Determination/Estimation of Age**

Annexure - 34-A

To,  
The \_\_\_\_\_  
Reference : Your Letter No. \_\_\_\_\_ Dated \_\_\_\_\_  
Name : \_\_\_\_\_  
Age stated : \_\_\_\_\_ ; Sex : \_\_\_\_\_ ; Occupation : \_\_\_\_\_  
Marital status : \_\_\_\_\_  
Address : \_\_\_\_\_  
Brought by Police Constable : \_\_\_\_\_ No. : \_\_\_\_\_ ; P.S. \_\_\_\_\_  
Identified by : \_\_\_\_\_  
Date and Time of Examination : \_\_\_\_\_  
Place of Examination : \_\_\_\_\_  
Consent : \_\_\_\_\_  
\_\_\_\_\_

Signature of Examinee

(If minor below 12 yrs. consent of Parents/Guardian)

Examined in presence of : \_\_\_\_\_

(If female)

(Signature of female attendant)

Identification marks :

1. \_\_\_\_\_

2. \_\_\_\_\_

Birth Date : \_\_\_\_\_

Education : \_\_\_\_\_

**Physical Examination :**

1. Height : \_\_\_\_\_ cm

2. Weight : \_\_\_\_\_ kg

3. Chest girth at the level of nipple : \_\_\_\_\_ cm

4. Abdominal girth at the level of navel : \_\_\_\_\_ cm

5. General build and appearance : \_\_\_\_\_

6. Hairs : Pubic : \_\_\_\_\_, Axillary : \_\_\_\_\_, Facial : \_\_\_\_\_, Scalp : \_\_\_\_\_



7. Development of breasts : \_\_\_\_\_

8. Development of genitals : \_\_\_\_\_

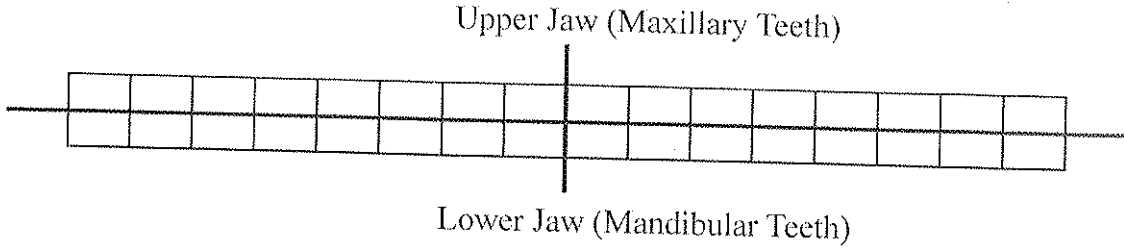
9. Onset of Puberty :

Voice : \_\_\_\_\_

Adam's apple : \_\_\_\_\_

Date of menarche : \_\_\_\_\_ Regularity of menses : \_\_\_\_\_

10. Dental Status :



11. Advised X-ray :

- a.
- b.
- c.

'X-ray' plate No.: a. \_\_\_\_\_ b. \_\_\_\_\_ c. \_\_\_\_\_

Dated :

**Provisional Age Certificate**

On clinical examination of the individual, age is about \_\_\_\_\_ years. However, the final opinion regarding the age should be collected from this office after submission of the Radiological report and the birth certificate.

Signature

(Dr.

)

Designation & Seal

Place : \_\_\_\_\_

Date : \_\_\_\_\_

Age Certificate

To  
The \_\_\_\_\_

Reference : Age estimation of \_\_\_\_\_, Dated \_\_\_\_\_

Sir,

I, Dr. \_\_\_\_\_, after going through the findings  
of \_\_\_\_\_

Physical examination report No. \_\_\_\_\_, Dated \_\_\_\_\_

'X' ray plate No. \_\_\_\_\_, Dated \_\_\_\_\_

Radiological Examination report No. \_\_\_\_\_, Dated \_\_\_\_\_

and the Date of Birth Certificate No. \_\_\_\_\_, Dated \_\_\_\_\_

produced before me,

**I am of the opinion that the individual's age is about \_\_\_\_\_ years**

(Dr. \_\_\_\_\_ )  
Signature  
Designation & Seal

Place : \_\_\_\_\_

Date : \_\_\_\_\_

Examination / Certification of Alcoholic

A Model Scheme of Examination

Anneure-34-B

To,

The Investigating Officer P.S.

Reference : Your letter No.

Dated :

I am forwarding herewith the result of my examination of

Name : Son / daughter / wife / widow of

Age : Sex : M/F Weight :

Address :

Consent for examination :

Signature / Thumb impression of Examinee

Identification Marks :

- 1.
- 2.

Brought by P.C. Name : No. P.S.

Date and time of examination :

Place of examination :

History :

- a. Alleged case -
- b. Related to alcohol -
- c. Illness -

General behaviour :

Clothing :

Attitude :

Memory : Mental alertness :

Pulse : Respiration :

Temperature : Blood pressure :

Skin :

Smell of alcohol, if any :

Lips :

Tongue :

Eye :

Pupils :

Conjunctiva :

Muscle co-ordination :

Gait :

Speech :

Handwriting

Reflexes :

**Systemic examination :**

Respiratory System :

Cardio-vascular System :

Gastro-intestinal Tract :

Laboratory investigations :

**a. Blood** (5 to 10 ml venous blood) **Preservative :**

**b. Urine** (10 to 20 ml - 2 samples) **Preservative :**

**c. Expired air :**

Diagnosis :

Opinion : I am of the opinion that -

1. The above person has consumed alcohol and is under its influence.
2. The above person has consumed alcohol and is not under its influence.
3. The above person has not consumed alcohol.

Place :

Date :

Signature

Time :

(Dr. \_\_\_\_\_ )

Designation & Seal

**Form 'A'**  
**(See Rule No. 3)**

(Certificate by Registered Medical Practitioner showing whether a person examined by him has or has not consumed an intoxicant)

Serial No. \_\_\_\_\_

Name & location of the  
Dispensary or Hospital

Certified that Shri / Smt / Kum. \_\_\_\_\_ Resident of \_\_\_\_\_

was brought to this Hospital / Dispensary by \_\_\_\_\_  
(Here state the Name & Designation of the Officer)

on \_\_\_\_\_ at \_\_\_\_\_ A.M. / P.M. & was examined by me  
on \_\_\_\_\_ at \_\_\_\_\_ A.M. / P.M.

A clinical examination of the above person disclosed the following :

Age: \_\_\_\_\_ Years, Weight : \_\_\_\_\_ kg, Height : \_\_\_\_\_ cm

Breath : Smelling / Not smelling of Alcohol / Ganja / Bhang.

Speech : Incoherent / Normal

Gait : Unsteady / steady

Pupils Dilated / Normal

Additional remarks, if any :

I find that the above named person \_\_\_\_\_

HAS CONSUMED \_\_\_\_\_ Alcohol / Ganja / Bhang

HAS NOT CONSUMED ANY INTOXICANT

**I also find that he / she is not under the influence of alcohol.**

(N.B. : Blood from the body of the above named was / was not collected by me for chemical examination)

“Certified that the procedure laid down under the rule (4) of Bombay Prohibition Medical Examination and Blood Test Rule 1959 has been followed.”

Date :

Signature

Time : \_\_\_\_\_ A.M. / P.M.:

Designation

Signature / Thumb impression of the Person examined.

Marks of identification of the person examined in case he refuses to give his signature or thumb impression

Form "B"

No. \_\_\_\_\_

From,  
The Casualty Medical Officer, / Assistant Professor in Forensic Medicine  
MGM Medical College and Hospital,  
Aurangabad

To,  
The Director  
Forensic Science Laboratory & Chemical Analyser  
Govt. of Maharashtra, Mumbai

Date :

Sir / Madam,

I am forwarding herewith a parcel by post / with Shri \_\_\_\_\_  
of \_\_\_\_\_ containing \_\_\_\_\_ ml. of Blood and / or Urine sample collected by  
me on \_\_\_\_\_ at \_\_\_\_\_ A.M. / P.M. from the body of Shri / Shrimati / Kumari  
\_\_\_\_\_ of \_\_\_\_\_ who  
was produced before me for medical examination and/or collection of Blood and / or Urine from  
his / her body by \_\_\_\_\_ and request to test the  
Blood and / or Urine and issue a certificate (in duplicate) regarding the result of the tests.

"Certified that the procedure laid down under the rule (4) of Bombay Prohibition Medical  
Examination Blood Test Rule 1959 has been followed".

Yours faithfully,

( Dr. \_\_\_\_\_ )

Casualty Medical Officer  
Assistant Professor in Forensic Medicine  
MGM Medical College and Hospital,  
Aurangabad

Facsimile of the Seal or  
Monogram used for Sealing the  
Phial containing Blood and/or Urine



**Examination of the Weapon**

Annexure-34c

To

The Investigating Officer,

Police Station \_\_\_\_\_

Reference : Your letter No. \_\_\_\_\_ Dated \_\_\_\_\_

Sir,

With reference to the above letter, I am sending the report about weapon sent sealed in connection with the injuries of \_\_\_\_\_

Name of weapon : \_\_\_\_\_ Kind of weapon : \_\_\_\_\_

Type of weapon : \_\_\_\_\_

Description of the weapon :

Blade : Is of \_\_\_\_\_, Texture : \_\_\_\_\_

Length : \_\_\_\_\_, Breadth : \_\_\_\_\_, Thickness : \_\_\_\_\_

Edges / Margins : \_\_\_\_\_, Point : \_\_\_\_\_

Stains / Foreign body, if any : \_\_\_\_\_

Joint : Type : \_\_\_\_\_, Hilt : Size : \_\_\_\_\_

Handle : Is of \_\_\_\_\_, Texture : \_\_\_\_\_

Length : \_\_\_\_\_, Breadth / Circumference : \_\_\_\_\_

Stains / Foreign body, if any : \_\_\_\_\_

(Advised to send it to C.A. for further detail examination)

Injuries possible :

Injuries impossible :

Identification marks if any on the weapon.

(Put the signature on the weapon)

The weapon packed, sealed and handed over to P.C. \_\_\_\_\_ No. \_\_\_\_\_ P.S. \_\_\_\_\_

Place : \_\_\_\_\_

Date & Time : \_\_\_\_\_

Receipt of weapon & report

Signature

(Dr. \_\_\_\_\_ )

Designation & Seal

**Examination / Certification of the Injured (Injury Report/Certificate)**

To

The Investigating Officer.

Annexure-34-D

Police Station \_\_\_\_\_

Reference : Your Letter No. \_\_\_\_\_ Dated \_\_\_\_\_

Sir,

I am forwarding herewith the report of examination of :

Name of Injured : \_\_\_\_\_ Son/Wife/Daughter/Widow of \_\_\_\_\_

Surname \_\_\_\_\_ resident of \_\_\_\_\_

Age: \_\_\_\_\_ Sex \_\_\_\_\_ Occupation \_\_\_\_\_

Brought by PC \_\_\_\_\_ No. \_\_\_\_\_ P.S. \_\_\_\_\_

Consent for examination :

Signature of Witness

Signature of Examinee

Identification marks:

1.

2.

**History :**

Sr. No.	Type of injury	Size of injury	Situation over the body	Nature of injury	Probable weapon	Age of injury	Advice

**Remark**

**Place :**

**Date :**

**Signature**

**(Dr \_\_\_\_\_ )**

**Receipt**

**Designation & Seal**

**Form No. 4**

(For hospital in patient death, not to be used for still birth)

Annexure-34-E

**MEDICAL CERTIFICATE OF CAUSE OF DEATH**

(To be sent to Registrar of Births and Deaths along with Death Report form no. 2)

Name of Hospital : \_\_\_\_\_

I do hereby certify that the person whose particulars are given below died in Hospital in Ward No. \_\_\_\_\_

on \_\_\_\_\_ at \_\_\_\_\_ A.M. / P.M.

Name of the deceased :

For use by  
statistical office

Address of normal Residence :

Sex	Age in yrs..	Date of Birth	Marital status S, M, W or D	Occupation	Religion	Age at Death				Detailed list code
						If under 1 year		If under 24 hours		
						Months	Days	Hrs.	Min.	

**Cause of Death**

Interval between  
onset and death approx

**1. Immediate Cause :**

State the disease, injury or complication which caused death, not the mode of dying such as heart failure, asthenia, etc.

a) \_\_\_\_\_

Due to :

or as a consequence of

**Antecedent cause :**

Morbid condition, if any, giving rise to the above cause, stating underlying condition last.

b) \_\_\_\_\_

Due to :

or as a consequence of

c) \_\_\_\_\_

**2. Other significant conditions**

contributing to death, but not related to the disease or condition causing it

\_\_\_\_\_

Natural / Accident / Suicide / Homicide (specify) : How did the injury occur?

**IF DECEASED WAS A FEMALE**

Was the death associated with pregnancy?

Yes/No

Was there a delivery?

Yes/No

Name or rubber-stamp of institution :

Serial Number of institution

Date of report

Date and Time :

Signature and address of

(Dr. \_\_\_\_\_ )

Designation & Seal

(To be detached and handed over to the relative of the deceased)

Certified that Shri / Smt/Kum. \_\_\_\_\_ S/W/D of Shri \_\_\_\_\_ Resident of \_\_\_\_\_

\_\_\_\_\_ was admitted to the hospital and expired on \_\_\_\_\_ at \_\_\_\_\_ a.m./p.m.

Date Time :

Signature

(Dr. \_\_\_\_\_ )

Designation & Seal

**EXAMINATION OF A CASE FOR DETERMINATION OF POTENCY**

FM No/ /20

Date : / / 20

To,

Annexure-34-F

**Reference :** Your letter / order no. \_\_\_\_\_ Dated - \_\_\_\_\_

Name of the individual- \_\_\_\_\_

Age as stated: \_\_\_\_\_, Sex: \_\_\_\_\_ Marital status (If married, duration) \_\_\_\_\_

Address : \_\_\_\_\_

Occupation : \_\_\_\_\_

Brought by (Name, signature & designation) \_\_\_\_\_

Date, place & time of examination : \_\_\_\_\_

Light arrangement - \_\_\_\_\_

**Consent :**

Q - Are you willing to be examined by me / us to opine in relation to your potency ? The examination will include physical examination, laboratory investigations and psychological assessment. The examination by dept of Urology would also include administration of drugs to evaluate your potency. You have right to refuse but this refusal may go against you in the court of law.

Answer given - Yes / No

Name, signature of the person giving consent with Date -

Witness to the consent - Name, signature & Date -

Identification marks-

1.

2.

**History**

1. Do you have erectile dysfunction ? - Yes / No

If yes

a. Since how long have you noticed the erectile dysfunction?

b. Did the problem being abruptly or insidiously?

- c. Do you have inability to achieve or maintain an erection or both ?
- d. Are you able to penetrate or not ?
- e. Whether partial penetration or ejaculation before penetration ?
- f. Do you ever get normal or near normal erection (During masturbation with other partner, early morning)
2. H/o any major illness - HT / DM / TB / Vascular disease / Endocrinal diseases etc.
3. H/o STD -
4. H/o mental illness -
5. Any stress-
6. Family environment-
7. Any history of medication / for what ailment / duration of medication
8. H/o Drug abuse - Nicotine / Ganja /Alcohol / other
9. H/o any head injury / spinal injury / any operation on genitals -
10. H/o aversion dislike / dejection / for any particular sex partner

**Obseervations**

**General examination**

General built and appearance : \_\_\_\_\_

Weight :                      kg    Height :                      cm

Teeth :    Total No. :

Secondary sexual characters :

Beard :    Moustache :

Axillary hairs :    Pubic hairs :

Breast development / Gynaecomastia if any :

Any marks of injury / scar on the body :

**Local examination** : (Along with Urology department) done in ward no \_\_\_\_\_

- a. Penis :
  - Circumcised / Non-Circumcised :
  - Stretched penile length -
  - Length when erect -
  - Circumference (flaccid & erect) :
  - Disease / deformity / injury (if any) :
  - Sensation over glans penis :
  - Foreskin (Retractable / Non-retractable) :
  - Dorsal penile pulsation :
  - Any Discharge :
  - Smegma :
  - Hygiene :

- b. Scrotum :  
Pendulous or not :  
Developmental defects :  
Deformities :  
Cremasteric reflex :
- c. Testes :  
Whether present in scrotum or not :  
Size :  
Consistency :
- d. Prostate (Per rectal examination) :
- e. Bulbocavernous reflex :
- f. Any evidence of S.T.D
- g. Effect of administration of \_\_\_\_\_ in \_\_\_\_\_ dose \_\_\_\_\_ After \_\_\_\_\_ minutes  
Result :

#### SYSTEMIC EXAMINATION

- C.N.S. :
- R. S. :
- C. V. S. Pulse :                      BP:  
Femoral artery :  
Dorsalispedis artery :
- G.I.T. :

**Laboratory Investigations (If required)**

1. CBC :
2. Hb :
3. BSL (Fasting & PP) :
4. Sr. FSH :
5. Sr. LH :
6. Sr. testosterone & Oestrogen :
7. Sr. prolactin :
8. VDRL :
9. USG/Colour doppler :
10. TFT (TSH, T3, T4) :
11. LFT :
12. HbA1C :

**Opinion :**After detailed examination i.e. based on physical examination, psychiatric evaluation and examination by urologist, we are of the following opinion". There is nothing to suggest that the above examined person is incapable to perform sexual intercourse ". / The person is in capable of performing sexual intercourse due to.....

Place : \_\_\_\_\_

Date \_\_\_\_\_

Signature

Name & Qualification :

Designation

Registration No. :



MEDICAL SICKNESS / UNDER TREATMENT CERTIFICATE

Annexure-34-G

Signature of the applicant \_\_\_\_\_  
(Government servant / Private)

I Dr. \_\_\_\_\_ after careful personal examination of the case hereby certify that Mr. / Mrs./ Ms. \_\_\_\_\_ whose signature is given above was suffering from \_\_\_\_\_ and was under my treatment for the same as Outdoor / indoor patient. And I consider that a period of absence from duty of \_\_\_\_\_ with effect from \_\_\_\_\_ is absolutely necessary for restoration of his / her health

He / She was advised rest for a period of \_\_\_\_\_ days

Identification marks:

- 1)
- 2)

Hospital No.

Date:

Authorised Medical Attendant  
Seal & Reg. No.

## MEDICAL FITNESS CERTIFICATE

Signature of the applicant \_\_\_\_\_  
(Government servant / Private)

I Dr. \_\_\_\_\_ after careful personal examination of the case hereby certify that Mr. / Mrs. / Ms. \_\_\_\_\_ whose signature is given above was suffering from \_\_\_\_\_ and was under my treatment for the same. He / She was advised rest for a period of \_\_\_\_\_ days.

He / She recovered completely from the illness and he/she is fit to resume his / her duty with effect from \_\_\_\_\_

Identification marks:

1)

2)

Hospital No.

Date:

Authorised Medical Attendant  
Seal & Reg. No.

**Certificate of Physical Fitness**

Annexure-34-H

This is to Certify that I have examined Shri / Smt / Kum. \_\_\_\_\_  
\_\_\_\_\_ who signed below in my presence and who  
is a candidate for employment for the post of \_\_\_\_\_ in  
the department / office \_\_\_\_\_ at \_\_\_\_\_

I could not discover that he / she has any disease (communicable or otherwise) constitutional  
weakness or bodily infirmity, except \_\_\_\_\_. I do consider / do not consider  
this is a disqualification for such an employment.

He / she \_\_\_\_\_ age is according to his / her own  
statement \_\_\_\_\_ years and by appearance about \_\_\_\_\_ years.

Identification marks:

1)

2)

Signature of the applicant : \_\_\_\_\_  
(Government servant / Private)

Hospital No.

Date:

Authorised Medical Attendant  
Seal & Reg. No.

**Resolution No. 4.13 of BOM-55/2018: Resolved as follows:-**

- (i) Slow learners must be re-designated as potential learners.
- (ii) Students scoring less than 35% marks in a particular subjects/course in the 1<sup>st</sup> formative exam are to be listed as potential learners. These learners must be constantly encouraged to perform better with the help of various remedial measures.
- (iii) Students scoring more than 75% marks in a particular subjects/course in the 1<sup>st</sup> formative exam are to be listed as advanced learners. These learners must be constantly encouraged to participate in various scholarly activities.

**Resolution No. 3.1.4.2 of BOM-57/2019:**

- i.** Resolved to include “Gender Sensitization” into UG (from new batch 2019-2020) and PG (from existing batches) curricula. [**Annexure-21**]
- ii.** Resolved to align the module of “Gender Sensitization” with MCI CBME pattern for MBBS students.
- iii.** Resolved that Dr. Swati Shiradkar, Prof., Dept. of OBGY., MGM Medical College, Aurangabad will coordinate this activity at both campuses.

## **Annexure - 21**

**Gender sensitization for UG (2<sup>nd</sup> , 3<sup>rd</sup> , 8<sup>th</sup> semesters) and PG (3 hours)**

### **INCLUSION OF “ GENDER SENSATIZATION” IN CURRICULUM**

#### **Introduction :**

The health care provider should have a healthy gender attitude, so that discrimination, stigmatization, bias while providing health care will be avoided. The health care provider should also be aware of certain medico legal issues related with sex & gender.

Society particularly youth & adolescents need medically accurate, culturally & agewise appropriate knowledge about sex, gender & sexuality. So we can train the trainers for the same. It is need of the hour to prevent sexual harassment & abuse .

To fulfill these objectives, some suggestions are there for approval of BOS.

#### **Outline**

1)For undergraduates :- Three sessions of two hours each, one in 2<sup>nd</sup> term, one in 3<sup>rd</sup> term & one in 8<sup>th</sup> term.

2)For Faculties and postgraduates :- One session of two hrs .

3)For those want to be trainers or interested for their ownself, value added course, which is optional about sex, gender, sexuality & related issues.

### **Responsibility**

ICC of MGM, MCHA , with necessary support from IQAC & respective departments.

### **Details of undergraduate sessions**

#### **1)First session in 2<sup>nd</sup> term**

**Aim** – To make Students aware about the concept of sexuality & gender.

To check accuracy of knowledge they have,

To make them comfortable with their own gender identify & related issues.

To make them aware about ICC & it is functioning.

**Mode** – Brain storming , Interactive power point presentation experience sharing.

**Duration** – Around two hours

**Evaluation** – Feedback from participants.

#### **2)Second session in 3<sup>rd</sup> / 4<sup>th</sup> term**

**Aim** – To ensure healthy gender attitude in these students as now they start interacting with patients.

To ensure that the maintain dignity privacy while interacting with patients and relatives, particularly gender related.

To make them aware about importance of confidentiality related with gender issues.



To encourage them to note gender related issues affecting health care & seek solutions.

Mode – focused group discussions on case studies, Role plays & discussion.

--3--

Duration – Around two hours.

Evaluation – Feedback from participants.

Third session in 8<sup>th</sup> term.

**Aim** – To understand effect of gender attitudes on health care in various subjects.

To develop healthy gender attitude while dealing with these issues.

**Mode** – Suggested PBL by departments individually. ( In collaboration with ICC till faculty sensitization is complete)

**Evaluation** – Feedback

\*\*\*\*

**FOR POSTGRADUATES**

Session of 2-3 hrs preferably in induction program.

**Aim** – To introduce medically accurate concept of gender, sex, gender role & sex role.

To ensure healthy gender attitude at workplace.

To understand gender associated concepts on health related issues & avoid such bias while providing health care.

To make them aware about ICC & its functioning.

**Mode** – Interactive PPT

Role plays & discussion

**Duration** – 2 to 3 hrs

**Evaluation** – Feedback.

**FOR FACULTIES**

Session of 2 hours may be during combined activities.

**Aim** – To ensure clarity of concept about gender & sex.

To discuss effect of these concepts on health-related issues.

To identify such gender & sex-related issues in individual subject specialties.

To discuss methodology like PBL for undergraduate students when they are in 7<sup>th</sup>-8<sup>th</sup> semester.

**Mode** – Role play

    Focused group discussion

    Case studies

**Evaluation** – Feedback.

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Sdp-Pimple/joshi-obgy