Operational Manual of MBBS Curriculum 2021

Subject:
Pathology

Developed By
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Preface

Curriculum is not the sole determinant of the outcome, it is very important as it guides the faculty in preparing their instruction and tells the students what knowledge, skills and attitude they are to develop through the teaching learning process. The ultimate indicators of assessing curriculum in medical education is the quality of health services provided by its graduates with required competencies.

To implement that curriculum all concerned such as teachers, students, deans, administrators, policymakers to be more dynamic, should run smoothly with the time & appropriate pace. This operational manual to implement the curriculum will act as a catalyst, will give momentum in implementing the curriculum. This operational manual will help to implement the curriculum uniformly, effectively, efficiently & smoothly at all the govt. & non govt. medical colleges under all the universities all over the country.

I would like to mention that the curriculum planning process is continuous, dynamic and never-ending as it is not static. If it is to serve best, the needs of the individual student, teacher, educational institution and the community to whom we are ultimately accountable, must be assessed. Before that assessment we should seriously concentrate for the better implementation of the curriculum. Implementation in regards to teaching-learning, integrated teaching, teaching on generic topics on medical humanities, clinical teaching, ambulatory care/OPD based teaching and acquiring identified competencies of each subject. There is a proverb that "Assessment drives Learning". To ensure students' learning formative and summative assessments should be taken care of properly. This operational manual on developed MBBS curriculum 2021 will play a vital role in those regards.

I congratulate all who were involved in developing this operational manual implement MBBS curriculum 2021, particularly the Director (Research, Publication & Curriculum Development), DGME, focal persons, teachers, members of the concerned society, seniors, juniors, legendary teachers & heads of the departments of Pathology. Different Govt. and non Govt. medical colleges. Special appreciation to the Deans, Faculty Medicine of different medical Universities who were requesting to develop this operational manual and will take lead to implement this operational manual. They contributed a lot to complete this activity, a commendable job and deserve special appreciation.

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Acknowledgement

It is easier to change a graveyard than to change a curriculum. Yet then time & society demand for the change of the curriculum. In such a situation MBBS curriculum 2012 was reviewed and updated in 2021 to fulfill the need of the stakeholders. The updated MBBS curriculum 2021 was started to implement from the August 2022. For implementation of that reviewed & updated curriculum operational manual is also the demand of the present time.

For better implementation of integrated teaching, teaching as per identified competencies, teaching on generic topics on medical humanities, planning, designing, constructing assessment tools for formative and summative assessment, this operational manual will act as the road map.

Research, Publication & Curriculum Development (RPCD) of DGME in association with heads of the departments of Pathology of different Govt. & non govt. medical colleges & Deans Offices, DGME, ME, FWD, BM&DC took the initiative to develop the operational manual. Concerned stakeholders meetings were held through active participation of different professional groups, focal persons, faculty members, heads of the department of Pathology of Phase III of different govt. & non govt medical colleges of Bangladesh.

I hope this operational manual will help to serve as guiding principle for the students and as well as for faculty members.

Last but not least, I would like to extend my deep gratefulness to the Director General, DGME, ADG(ME) & ADG(Admin), DGME, all Directors of DGME, faculty members of Pathology of different Govt & non Govt medical colleges and others who shared their expertise, insights, contributed and worked hard to develop this precious document. Efforts given by the focal persons providing their valuable time, opinions & efforts during the development process of this operational manual for Phase III of MBBS curriculum are duly acknowledged.

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Background and Rationale

Curriculum is a study track along which students travel throughout the course of study. In this journey teachers play an important role in regards to teaching learning and assessment. To produce need based, community oriented, competent graduate medical doctors, MBBS curriculum was reviewed and updated in 2021. The updated MBBS curriculum 2021 was started to implement from the August 2022. For better implementation of MBBS curriculum 2021 effectively, uniformly & competently an operational manual of each subject was felt by each of the Faculty of Medicine of all universities. In this regard Director (Research, Publication & Curriculum Development (RPCD) of Directorate General of Medical Education (DGME) has taken the time felt initiative under the gradience of Director General, DGME. Thanks to DG, DGME, Director (RPCD), DGME, focal persons, members of the concerned society, senior, junior and legendary teachers and heads of the department of concerned subject of different government & non government medical colleges to finalise this operational manual. This operational manual will work as the skeleton of the curriculum in a comprehensive manner. This user-friendly document will serve the purposes of the faculty to ensure better teaching-learning and assessment to produce knowledge competent and compassionate physicians in Bangladesh.

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List of Contents

The MBBS course is divided into four phases.

Phase	Duration	Subjects	Examination
1st phase	1½ years	• Anatomy • Physiology • Biochemistry	First Professional MBBS
2nd phase	1 year	• Pharmacology & Therapeutics • Forensic Medicine & Toxicology *Only lecture, small group teaching (practical, tutorial etc.), clinical teaching (as applicable) & formative assessment will be conducted in following subjects- General Pathology part of Pathology, General Microbiology part of Microbiology, Medicine & Allied subjects, Surgery & Allied subjects*	Second Professional MBBS
3rd phase	1 year	• Community Medicine & Public Health • Pathology • Microbiology *Only lecture, small group teaching (practical, tutorial etc.), clinical teaching (as applicable) & formative assessment be conducted in following subjects- Medicine & Allied subjects, Surgery & Allied subjects, Obstetrics and Gynaecology.*	Third Professional MBBS
4th phase	1½ years	• Medicine & Allied subjects • Surgery & Allied subjects • Obstetrics and Gynaecology	Final Professional MBBS

NB: All academic activities including professional examination of each phase must be completed within the specified time of the phase.

Special note: After taking admission into the first year of MBBS course, a student must complete the whole MBBS course (pass the final professional MBBS examination) within 12 years' timeline.

Phase II

- Generic Topics on Medical Humanities to be taught in Phase-II
- Integrated Teaching in Phase II
- Subjects of Phase II--
    - Pharmacology & Therapeutics
    - Forensic Medicine & Toxicology
        - General Pathology only for teaching learning & formative assessment
        - General Microbiology only for teaching learning & formative assessment

Phase III

- Generic Topics on Medical Humanities to be taught in Phase-III
- Integrated Teaching in Phase III
- Subjects of Phase III
    - Community Medicine & Public Health
    - Pathology
    - Microbiology

Overview and Assessment of Phase- III: Implementing MBBS Curriculum 2021

Basic information

i. Total duration of Phase III is 12 months including Third Professional MBBS Examination. The course is expected to start on first day of July of each calendar year.

ii) Teaching learning of the students in the form of large group teaching as well as small group, student cantered competency based teaching which includes lecture, tutorial and practical classes.

iii) Time for integrated teaching and formative/summative examinations including their preparatory leave is common for all subjects of the phase.

iv) Assessment:

Third Professional MBBS examination to be started on first working day of May or November of each year.

- There will be in-course item examinations, term/card completion examinations and 3rd Professional MBBS examination for the students.
- Certain percent of marks in the form of from formative assessment (Term ending examination, class attendance, Integrated Teaching, Generic Topics on Medical Humanities and timely completion of item examinations) will be added in the 3rd Professional MBBS examination in the subject of Pathology.

Departmental Objectives

After completion of pathology course, undergraduate medical students will be able to:

- Explain basic mechanism of diseases: Aetiology, pathogenesis, morphological changes with emphasis on common diseases prevalent in Bangladesh.
- Co-relate between clinical findings and pathological changes.
- Chalk out simple investigation plan for diagnosis and follow up of diseases.
- Interpret laboratory results and understand their implication.
- Demonstrate knowledge about the use of Histopathology, FNAC, Cytological examination, Pap smear, Frozen section and Immuno-histochemistry
- Develop attitude for further learning of the subject.
- Develop skills to perform
    - TC, DC, Eosinophil count, estimation of Hb% and ESR , Platelet count.
    - Semen analysis
    - Routine examination of Urine
    - Microscopic examination of body fluids
    - CSF examination
    - Preparation of preservative and fixative- 95% Alcohol, 10% Formalin.
    - Preparation of preservative and fixative- 95% Alcohol, 10% Formalin.
    - Writing a requisition form for histo-pathological and cytological examination

List of Competencies to acquire:

1. Writing a histopathological requisition form
2. Preservation of surgical specimens in Upazila health complexes and district hospitals and preparation of fixative for surgical specimens (10% formalin
3. Sending of surgical specimens from Upazila health complexes and district hospitals to nearby medical college and larger hospitals where histopathology service is available.
4. Collection of Paps' smear/ FNAC from superficial mass lesions
5. Preservation of cyto-pathological smears
6. Sending of cytopathology specimens from Upazila health complexes and district hospitals to nearby medical college and larger hospitals where cytopathology service is available
7. Preservation of surgical specimens for immunohistochemistry and immune florescence study
8. Writing a requisition form for immunohistochemistry or immunofluorescence examination
9. Determination of Hb%, ESR, TC & DC of WBC, total count of eosinophil, BT and CT, preparation of stain and comment on PBF.
10. Performing routine urinary examination at health complexes
11. Handling and maintenance of Microscope
12. Performing semen analysis
13. Performing microscopic examination of body fluid-CSF
14. Interpretation of pathology reports and data
15. Writing advice for pathological investigations.

Teaching-learning methods, teaching aids and evaluation					
Teaching methods				**Teaching aids**	**In course evaluation**
Large group	**Small Group**	**Self-learning**	**Others**		
Lecture	Tutorial Practical	Assignment Self-study	Integrated Teaching	Computer & multimedia Chalk & board White board & markers OHP, Slide projector Flip chart, Models Specimens Projector. Online media Microscope with LED monitor Study guide & manuals etc.	• Item examination • Card final (written, Oral + Practical) • Term final (written, Oral + Practical)

Distribution of teaching - learning hours and days

Lecture	**Tutorial**	**Practical**	**Total Teaching hours**	**Integrated teaching hour for Phase II**	**Formative Exam**		**Summative exam**	
					Preparatory leave	**Exam time**	**Preparatory leave**	**Exam time**
95 hours	94 hours	34 hours	223 Hours	15 hours	10 days	15 days	10 days	15 days
Time for examination preparatory leave and formative & summative assessment is common for all subjects of the phase)								
Related behavioural, professional & ethical issues will be discussed in all teaching learning sessions								

Hour distribution of Pathology in Phase II and Phase III				
Phase	Lecture (In hours)	Tutorial (In hours)	Practical (In hours)	Total (In hours)
Phase II (3rd year)	35	40	07	82
Phase III (4th Year)	60	54	27	141
Grand total				223

- Note: Time for Integrated teaching: 18 hours (Two hours with each topics).

Class hours in schedule and formative assessment in Phase II (3rd year)			
	Lecture	Tutorial/Practical	Formative assessment
Term I	2 lectures each of 1 hour/week	1 class each of 2 hours/week	Term 1 (Card 1A) examination with other subjects of Phase II
Term II	2 lectures each of 1 hour/week	1 class each of 2 hours/week	Card (Card 1B) completion examination.

- Note:
- Class hours will be adjusted with other subjects in Phase II-like post-mortem period of Foreign Medicine.
- Term I (Card 1A) preferably in 2nd half of October (Month 4) and Card 1B completion examination, preferably at the end of completion of all scheduled (Lecture, Tutorial, Practical) classes and "Items" contained in Card 1B (Month 8).

Class hours in schedule and formative assessment in 4th year			
	Lecture	Tutorial/Practical	Formative assessment
Term I	4 lectures each of 1 hour/week	2 classes each of 2 hours/week	Term 1 (Card 2A) examination with other subjects of Phase III
Term II	4 lectures each of 1 hour/week	2 classes each of 2 hours/week	Term II (Card 2B) examination with other subjects of Phase III

- Note:
- Class hours will be adjusted with other subjects in Phase III-like Study tour, field visit and RFST of Community Medicine.
- Term I (Card 2A), preferably in 2nd half of October (Month 4) and Term II (Card 2B), preferably in the month of March (Month 9) when the Professional exam is in the month of May.

Academic calendar for Pathology, Phase II, 3rd year (In months)											
1	2	3	4	5	6	7	8	9	10	11	12
General Pathology: Card IA			Preparation and term I examination	General Pathology: Card IB			Card completion (Card 1B) completion examination		No Professional examination		

Academic calendar for Pathology, Phase III, 4th (In months)											
1	2	3	4	5	6	7	8	9	10	11	12
Systemic Pathology Card 2A			Preparation and term I examination	Systemic Pathology Card 2B				Preparation and term II examination	Preparatory leave. Professional examination		

- All In-course assessment Term final/card final examination (both regular & supplementary) will be written, oral & practical and it will be organized by Phase III committee.
- Card final exam with written, viva and practical will be at the completion of classes scheduled (lecture, tutorial and practical) and items of the card contained.
- Term I (Card 1A) and Card completion (Card 1B) examinations in 3rd year and 1st +2nd term (Card 2A and Card 2B) examinations in 4th year.
- Month 1 is month July when the prof exam is in month of May and Month 1 is month January when the prof exam is in month of November.

Generic Topics on Medical Humanities:

Common classes of phase III (3hrs)

I. Integrity and accountability of medical professional
II. Aspects of a good doctor.

Methods of teaching on medical humanity

- Each session will be taught under supervision of phase III coordination committee in collaboration with Medical Education Unit.
- Sessions will be under the guidance of Principal and Vice Principal coordinated by the department of Pathology.
- Sessions will be delivered by concerned experts of the topics. Each session will be one and half hour duration.
- Attending these sessions will be mandatory and the attendance will be reflected in the formative and summative assessments.

Topics	Learning objective	List of contents	Method	Time
Integrity and accountability of medical professionals	• Define integrity and accountability in medical practice • Mention importance of integrity and accountability in medical practice • Outline doctors behaviors that demonstrate integrity and accountability. • Explain contribution of the team and the system to integrity and accountability • State means of developing integrity and accountability of medical professionals • Mention some current examples of integrity and accountability of medical professionals.	• Definition of integrity and accountability in medical practice • Importance of integrity and accountability in medical practice • Outline of doctors behaviors that demonstrate integrity accountability • Contribution of the team and the system to integrity and accountability • Means of developing integrity and accountability of medical professionals • Some current examples of integrity and accountability of medical professionals.	Interactive Lecture or Seminar	One and half hour

Integrated Teaching in Phase-III

- All the departments of phase III (Community Medicine & Public Health, Pathology, Microbiology) will be actively involved will arrange in the integrated teaching while the faculty representatives from clinical & others departments will also participate.

- In the coordination meeting, the topics, venue, date and time will be selected with greater and proper emphasis to the concerned department of Phase III so that they are specifically focused in the session.

- Phase III committee in collaboration with medical education unit (MEU) will ensure presence of the students in the integrated teaching sessions. Out of total 18 hours, each session will be at least for 2 hours.

- Teachers of the concerned departments will be the speakers in each session and participation of the students of phase III will be ensured. Students need to get some 'Take home message' from every session.

- Out of these topics, every student will submit two assignments to the department which will be available during practical part of third professional examination.

Topics of Integrated Teaching in Phase-III:

1. Occupational and environmental hazard
2. Snake bite
3. Transportation injuries
4. Disaster management
5. Shock
6. Glomerulonephritis
7. Rheumatoid Arthritis/Osteomyelitis
8. Different Viral Fevers Covid-19, Dengue, Chikungunya)
9. Carcinoma Cervix

NB: For department of Pathology- Shock Glomerulonephritis Carcinoma Cervix

Topics	Learning objective	Core contents	Discipline involved	Teaching hours
Shock	At the end of be session students will be able to: • Define shock • Mention different types of shock • Describe the pathogenesis of shock • Enumerate the clinical feature • List the required laboratory investigation • Manage the shock	• Definition of shock • Types of shock • Clinical stage of shock • Compensatory mechanism of shock • Pathogenesis & complications of shock • Management of shock	• Pathology • Microbiology • Medicine • Pharmacology • Forensic Medicine & Toxicology	
Glomeruloneph ritis	At the end of be session students will be able to : • Define glomerulonephritis • Classify the glomerular disease\ • Describe the etiopathogenesis • Mention clinical presentation • Diagnose the disease • Outline the management of the disease • State the prognosis of the disease	• Review of the renal anatomy • Definition of glomerulonephritis • Pathogenesis • Types & clinical presentation (glomerulonephritis & nephrotic syndrome) • Diagnosis • Management & prognosis	• Pathology • Microbiology • Pharmacology • Medicine • Nephrology • Pediatrics • Forensic Medicine & Toxicology	
Carcinoma cervix	At the end of be session students will be able to : • Mention the clinical importance of disease • Describe etiopathogenesis of Ca cervix • Enumerate clinical presentation & gross morphology • Mention the complication of Ca cervix • Diagnose Ca cervix	• Prevalence of disease • Predisposing factor • Clinical feature • Etiopathogenesis • Diagnosis (gross & morphological findings) • Management & cytotoxic drugs • Prevention	• Pathology • Microbiology • Pharmacology • Gynecology • Oncology • Forensic Medicine & Toxicology	

	• Mention the precaution & screening of Ca cervix			

Osteomyelitis	At the end of be session students will be able to : • Enumerate the causative agents of osteomyelitis • Explain pathogenesis of the disease • Enumerate the site of involvement in the disease process • Diagnose the disease • Outline the management of this disease • Describe the complications of this disease and their management	• Etiopathogenesis • Site of involvement • Diagnosis • Management • Complications & its management	• Microbiology • Pharmacology • Pathology • Orthopedic Surgery/Surgery • Forensic Medicine & Toxicology
Rheumatoid Arthritis	At the end of be session students will be able to: • Explain the immunopathology of the disease • Diagnose the disease by its clinical feature and investigation findings • List the complications of the disease • Outline the management of this disease	• Immunopathology • Clinical features • Investigation • Complications • Conventional NSAIDs • Disease modifying agents • Biological disease modifying agents	• Microbiology • Pharmacology • Pathology • Orthopedic Surgery/Surgery • Physical Medicine /Medicine • Forensic Medicine & Toxicology

Different Viral Fevers (Covid-19,Dengue,Chikungunya)	At the end of be session students will be able to : • Mention the structure of the virus • Explain the mode of transmission of the disease • Explain the etiopathogenesis of the disease • Mention the organ involved in this disease • Explain the mechanism of organ involvement • List the complications of the disease • Describe the laboratory diagnosis • Out line the preventive measures of this disease • Outline the management of this disease • Mention the drug used with their site of action	• Structure of the virus • Mode of transmission • Pathogenesis • Clinical stages • Investigations • Prevention • Complication • Management • Drug used with their site of action	• Microbiology • Pathology • Pharmacology • Community medicine & public health • Medicine/Respiratory Medicine • Forensic Medicine & Toxicology

Occupational and Environmental hazard	At the end of the session student will be able to : • Define environment • Explain concept of hazard • List of occupational and environmental health hazard • Define occupational health and mention its objective • Explain various occupational environment • Describe preventive strategies of occupational and environmental hazard	• Environment and its components • Concept about hazard, Risk and vulnerability • Environmental control strategy • Existing law about environmental control • Occupational health, and its objectives • Occupational environment • Occupational health hazards, ergonomics	• Community medicine & public health • Forensic medicine & Toxicology • Medicine/ respiratory medicine. • Skin and VD • Microbiology • Pathology

	• Mention the health care facilities and safety measures for workplace. • State work's man compensation act.1923 • Describe exciting law for environmental control	• Principles of prevention of occupational diseases • Employees' benefits • Existing health related occupational laws.	
Snake bite	• Mention different types of snake in Bangladesh • State the natural habit of snake\ • Mention different snake bite geographic area in Bangladesh • State the difference between poisonous and nonpoisonous snake and snake bite • Mention the sign symptom of poisonous and nonpoisonous snake bite • Mention the composition of snake venom • Explain consequences of snake bite • Select the ant venom and its dose • State the treatment facilities in Bangladesh • Outline the management of snake bite • State the preventive measures of snake bite	• Epidemiology of snake bite in Bangladesh • Types of snakes • Habit of snakes Geographic area of snake bite in Bangladesh • Outcome of snake bite • Management of snake bit • Treatment facilities of snake bite in Bangladesh • Prevention and control measures of snake bites.	• Community medicine & public health • Forensic medicine & Toxicology • Medicine/Neuron medicine • Pathology • Pharmacology •

Small group teaching and learning

Compared to didactic lectures, effective small group teaching and learning strategies increase student engagement, retention of knowledge, self-directed learning, communication skills, teamwork ability, and peer discussion. Every participant is in close contact with each other and paid their maximum attention, efforts throughout the class by active participation which is important for effective learning. Junior as well as senior teachers will be involved with small group teaching of tutorial and practical classes.

A. **Stained slides:** Small group teaching (Tutorial/Practical classes) with stained slides as teaching aids. Molecular basis and microscopic tissue changes of General pathology will be taught and will be assessed by OSPE/VIVA examination.

Representative lesion	**Learning objectives**	**Examples of clinical integration And related investigations**
Acute appendicitis (H&E stained slide)	Acute inflammation: Vascular and cellular events. Chemical mediators. Congestion Suppuration, Ulceration, Oedema	Lung-Pneumonia, lung abscess Skin, soft tissue -Boil, carbuncle Acute mastitis
Chronic cholecystitis (H&E stained slide)	Chronic inflammation: Molecular basis Concurrent destruction and repair (Fibrosis) Cells-Macrophage, lymphocytes Granulation tissue.	Peptic ulcer Disease-Pyloric stenosis Pyelonephritis, Chronic bronchitis Chronic tonsillitis, Biopsy
Tubercular lymphadenitis (H&E stained slide)	Granulomatous inflammation: Molecular basis. Caseation necrosis, giant cells Fibrosis, Calcification	Lung-Pulmonary tuberculosis GIT-Intestinal tuberculosis Bone-Tubercular osteomyelitis Foreign body granuloma, leprosy, leishmaniosis, Sarcoidosis
Nodular hyperplasia of prostate. (H&E stained slide)	Adaptic change Proliferation stops when stimuli is withdrawn. Malignant potential	GIT-Hyperplastic polyp, Endometrial hyperplasia, Nodular goitre Tumour marker Small biopsy (TURP)
Invasive squamous cell carcinoma-grade 1	Features of malignancy: Molecular basis. Anaplasia Invasion Grading (Keratin pearl) Staging	Skin, Lip, Tongue, Oesophagus External genitalia, Cervix, Lung, Gall bladder Incisional/resection biopsy
Rhinosporidiosis (H&E stained slide)	Pathology of infectious diseases Tissue Changes-Abscess, Non-healing ulcer, Granuloma, Cyst.	TB, Leprosy, Leishmaniosis, Amoebiasis, Hydatid cyst Typhoid ulcer, HPV, fungal diseases Diagnosis: Incisional/resection biopsy, Special stain, Culture. PCR

Dysplasia/carcinoma in situ (Cervix) (H&E stained slide)	Cancer predispositions: Precancerous conditions Low malignant potential. Locally malignant Prognosis	Cervix, GIT, prostate, Urinary bladder. Endoscopic, Colposcopic, Colonoscopic biopsy, TURP, TURBT Special stain
Lipoma (H&E stained slide)	Benign tumour: Well differentiation Capsule-Physical barrier to invasion. Key prognostic indicator	Follicular adenoma thyroid Schwannoma Neurofibroma FNAC, Incisional/resection biopsy
Fibro adenoma (H&E stained slide)	Benign tumour Mixed tumour Teratoma Adeno-squamous carcinoma.	Pleomorphic adenoma Ovary-testis Wilms tumour kidney Cervix, Gall bladder Immunohistochemistry
Cirrhosis of liver (H&E stained slide)	Loss of architecture Fibrosis Fibrogenic cytokines (TGFβ1)	Keloid Wound contracture (Burn) Intestine-Crohns disease Heart- Old infarction Lung-Interstitial fibrosis Bone marrow-Myelofibrosis
Iron deficiency anaemia/ Thalassaemia (PBF with Leishman stain)	Morphological classification of anaemia Microcytosis and hypochromia Marrow iron -Nil Storage iron- exhausted Iron absorption- reduced Dietary deficiency Hereditary haemoglobin defect-Haemolysis	Chronic haemorrhage (menorrhagia) Increased demand (Pregnancy Lactation) Chronic disease-Hepsidine Iron profile, Hb electrophoresis
Vitamin B12/Folate deficiency (PBF with Leishman stain)	Morphological classification of anaemia: Macrocytosis Impaired DNA synthesis Nuclear maturation lags behind the cytoplasmic maturation.	Liver disease Alcoholism Vitamin B12 Folate Assay Bone marrow examination
Neutrophilia, eosinophilia, lymphocytosis (PBF with Leishman stain)	Immune response Reactive proliferation	Pyogenic bacterial infection Tissue injury, stress Metabolic derangement Allergic diseases, Chronic inflammation, Viral infection
ITP (PBF with Leishman stain)	Thrombocytopenia Depressed megakaryopoiesis Increased destruction Increased consumption	Bone marrow aplasia, Drugs, chemotherapy viral infections ITP Shock with systemic inflammation, DIC Haemorrhagic screening test Antiplatelet antibody

		Bone marrow examination
Acute leukaemia /Chronic leukaemia (PBF with Leishman stain)	Immature cells (Blasts, Myelocytes) Radiation, drugs/chemicals-Mutation Maturation arrest Infiltration/flooding of immature blood cells in bone marrow, blood and other organs	Leukaemoid reaction Leucoerythroblastic blood picture Stem cell therapy. Bone marrow examination Genetic analysis Cytochemistry
Special (PAS, Immunostained)	Histopathological examinations of biopsy specimens. Tissue origin, detection of primary sites of metastasis, Therapeutic response-prognosis. Detection of basemen membrane/invasion.	Lymphomas Ovarian cancers Gastric carcinoma Ca breast-er/pr, her2/neu Glomerular kidney diseases

NB: Teaching learning process is open and continuous process. Some model examples of clinical conditions has been given. Teachers will facilitate with their own way. Each and every medical college must ensure microscope wit LED monitor side by side of normal binocular microscope to teach microscopic findings of learning objectives.

B. **Museum specimens**: Small group teaching (Tutorial/Practical classes) with museum specimens as teaching aids. Necked eye morphological (Gross) features and their examples in related clinical conditions will be learned. Assessment will be done by OSPE/VIVA examination. Laminated photograph will be used till typical representative specimen not available.

Name of the specimen	**Learning objectives**	**Examples of related clinical conditions/investigations**
Acute appendicitis	Cardinal signs of acute inflammation: Red Swollen Purulent exudate	Ischemic bowel disease Acute tonsillitis Ovary-Twisted ovarian cyst Empyema, Abscess
Chronic cholecystitis with cholelithiasis	Chronic inflammation Thickened wall (Fibrosis) Ulcer, empyema Mucocele, Squamous metaplasia	Stones- Kidney Urinary bladder Ureter
Intestinal polyp	Inflammatory, Hyperplasia, Lymphoid proliferation Neoplastic (Dysplasia)	Cervical polyp Nasal polyp Fibro epithelial polyp

Cervical carcinoma	Morphology-Fungating, infiltrating, exophytic, Ulcerated growth Histological type: SCC, adenocarcinoma.	Other lesions: Prolapse/polyp with ulcer Colposcopic biopsy Immunohistochemistry
Uterine leiomyoma	Benign tumour of smooth muscle. Non-capsulated Menorrhagia-Anaemia Abortion, Obstructed labour.	Adenomyosis, Endometrial carcinoma, Leiomyosarcoma Types: Sub serous, submucosal intramural. Non-capsulated tumour-Haemangioma
Multinodular goitre	Chronic inflammation Hyperplasia Multiple nodule Haemorrhage, Necrosis, Cyst/cavity formation Calcification	Endometriosis, Organized hematoma, Haemorrhagic infarct, Malignancy.
Osteosarcoma	Sarcoma Younger age Haemorrhage, necrosis Poorer prognosis	Liposarcoma Rhabdomyosarcoma Chondrosarcoma Ewing's sarcoma
Serous/mucinous Ovarian cystadenoma ovary	Cyst: Closed sac having distinct envelop. Cystic Benign/malignant lesions.	Cystic MNG Serous cystadenocarcinoma- ovary Cystic papillary ca thyroid Pancreatic pseudo cyst Polycystic kidney disease Polycystic ovarian syndrome
Adenocarcinoma colon/stomach	Malignant epithelial neoplasm growing in glandular pattern. Mucous secretion, poorer prognosis than SCC	Stomach, Breast, Lung Prostate, Oesophagus. Tumour markers, Biopsy Immunohistochemistry
Lipoma	Benign tumour Slow growing Circumscribed. Mobile	Neoplastic/non neoplastic lesions of skin soft tissue Backers cyst, Ganglion, Fibro epithelial polyp Epidermal inclusion cyst.
Carcinoma breast	Predispositions of malignancy Molecular basis of cancer Mutation Systemic effects of cancer	Mammography FNAC Core biopsy, Frozen section/open biopsy Immunohistochemistry-ER,PR

NB: Teaching learning process is open. Some model examples of clinical conditions of systemic pathology has been given. Teachers will facilitate with their own way.

C. **Equipment's/ reagents**: Small group teaching (Tutorial/Practical classes) with equipment's/ reagents as teaching aids. Uses of the equipment's/ reagents and related clinical integration will be learned. Will be assessed by OSPE/VIVA examination.

Learning of Equipment's/Reagents (OSPE) in practical classes (Photograph when not available)		
Name of Equipment's/Reagents	Learning objectives	Related Clinical conditions and questions (OSPE)
Jar with 10% neutral buffered formalin	Fixation Denaturation of structural and enzymatic protein Prevention of autolysis and heterolysis. Others: Boins fixatives, Carnoys fixatives	Sending of biopsy specimens for histopathological specimen. Preservation of museum specimens.
Coplin jar with 95% alcohol	Fixative of cytopathological examination. Spray fixatives Linking together of molecules of the fixed tissue components. Expensive, inflammable, evaporates easily.	Direct smear FNAC of diff organs Smear made from body fluid. Nipple discharge.
Frozen section (Cryostat) machine	Perioperative rapid microscopic Diagnosis-Benign/malignant. Tissue is frozen (-15 to 25) instead of routine paraffin section. Margin clearance	Breast lump, Ovarian mass, Thyroid swelling, Hirsch sprung disease, Growth in the Intestine/oral cavity.
Core biopsy needle	When FNAC is inconclusive (Well differentiated malignancy) Core of tissue to see invasion. Immunostaining can be done	Breast Kidney Liver
Bone marrow aspiration needle	Bone marrow study: Cellularity, Myeloid erythroid ratio, Erythropoiesis, Granulopoiesis, Megakariopoiesis.	Acute and chronic leukaemia Multiple myeloma Myelodysplastic syndrome ITP
Trephine biopsy needle	Dry tap/Blood tap Depressed erythropoiesis/granulopoiesis. Marrow aplasia/Fibrosis	Aplastic anaemia, Myelofibrosis Drugs, chemotherapy, viral infection Granulomatous diseases-TB, leishmaniosis Metastatic carcinoma-Prostate, thyroid

Ayers wooden spatula	PAPs smear	Cervical intraepithelial lesion or malignancy. Infections-Candidiasis, Trichomonas vaginitis
Lumber puncture (LP) needle	CSF examination: Biochemical, Microbiological, cytological.	Meningitis, encephalitis, (bacterial, fungal, mycobacterial, and viral) subarachnoid haemorrhage
Vacutainer	Collection of blood Anticoagulants: Mechanism of action. Advantages	Different haematological and serological investigations.
Reagent strip	Principles. Advantages Disadvantages	Urine analysis for different systemic diseases

NB: Teaching learning process is open and continuous process. Some model examples of clinical conditions of are given. Teachers will facilitate with their own way. Laminated photograph will be used till equipment ((Cryostat machine) not available.

D. **Case histories:** Small group teaching with sharing the "case histories" taken by the students. Pathogenesis and their correlation with complains/complications and investigation tolls of the concerned system will be emphasized. Students (Buzz group) will present, share among themselves the "cases" and will definitely, deposit the assignment (5 cases) during the Item examination of Card 2A& 2B.

Case histories		
Name of the disease	Learning objectives Pathogenesis	Related clinical conditions of similar pathogenesis Diagnostic tools of the system
Rheumatic fever	Immune response Chronic inflammation	Tuberculosis Glomerulonephritis Rheumatoid arthritis
Chronic bronchitis.	Predispositions-smoking, irritation Chronic inflammation-destruction.	History, Lung function test
Pulmonary tuberculosis	Type IV cell mediated hypersensitive reaction followed by granulomatous inflammation. Casetion necrosis, Effusion, Fibrosis, Cavity formation, calcification.	Rheumatic fever Sputum/Fluid: AFB Stain, Culture, Gene expert Lymph node: FNAC, Biopsy Monteux test, CT guided FCAC Lung
Thalassemia	Genetic predisposition Pathogenesis-haemolysis, Anaemia, splenomegaly,	CBC, PBF Biochemical analysis of blood, Bony (skull) changes in X RAY. Hb electrophoresis

Chronic osteomyelitis	Infection Inflammation: Acute followed by chronic. Ischemic necrosis, Abscess	Septic arthritis, traumatic injury, bone tumour, bone tuberculosis Biopsy
Nephrotic/nephritic syndrome	Immune response-inflammation Glomerular injury Proteinuria, haematuria	Urine examination-haematuria, RBC cast. Serum and urinary protein Core needle biopsy (DIF)
Peptic ulcer disease	Predispositions-Smoking, alcohol, NSAID. Defence Vs damaging factor (HCL, Mucosal epithelium, Bicarbonate ion) Chronic inflammation	Endoscopic biopsy Neoplastic and non-neoplastic Ulcers in GIT
Diabetes mellitus	Type I-Genetic predisposition B βcell destruction Type 2-Obesity, βcell dysfunction	Blood sugar-Fasting, post prandial Urine for sugar OGTT Renal glycosuria, Alimentary glycosuria
Chronic Hepatitis	Infection, immune response Inflammation	Cirrhosis, gall stone disease, Primary and secondary malignancy LFT, Serological markers USG/guided FNAC
Endometriosis	Cyclical haemorrhage Chronic inflammation Hemosiderin laden macrophage, cystic degeneration	Ovarian cyst, Ovarian cancer Colon cancer Laparoscopic biopsy
Hypertensive heart disease	Predispositions-Stress, Smoking, Overweight, Less vegetable, exercise Atherosclerosis Heart enlargement	Lipid profile ECG, Echocardiography, Angiogram
Rheumatoid arthritis	Genetic and environmental factors Autoimmune destruction Chronic inflammation Injury to bone and cartilage Bony ankylosis fibrous ankylosis	Rheumatoid arthritis Gout, Reactive arthritis Radiological Rheumatoid factor Anti CCP antibody

NB: Teaching learning process is open and continuous process. Some model examples of clinical conditions of are given. Teachers will facilitate with their own way.

Report interpretations: Small group teaching (Tutorial and practical classes) using reports of different commonly done investigations as teaching aids, their interpretations and learning of related clinical conditions. Will be assessed in OSPE/viva examination.

Reports:	Learning objectives	Clinical integration and related investigations
Hypercholesterolemia	Atherosclerosis lipid profile	Ischemic heart disease Diabetes mellitus Nephrotic syndrome
Hyponatremia	Acid base disorder Serum electrolytes	Renal failure Respiratory failure Shock Diarrhoeal diseases

Azotaemia	Renal failure Renal function test	Shock Diabetes Mellitus Primary and secondary glomerular diseases
Hyperbilirubinemia	Liver function tests Jaundice-Conjugated, Un conjugated Prehepatic, hepatic, obstructive	Acute and chronic hepatitis Cirrhosis of liver Hepatocellular carcinoma Shock
Hyperglycaemia	OGTT	Diabetes Mellitus and other endocrine diseases, Shock
Cardiac markers	Cardiac injury	Ischemic heart disease-Myocardial infarction, Angina pectoris.
Oligozospermia	Semen analysis Azoospermia, Necrozospermia Asthenozospermia, Teratozospermia	Infertility Cryptorchidism, Vasectomy Testicular trauma, tumour, infection.
Increased bleeding time	Haemorrhagic screening test	ITP, Aplastic anaemia, Acute leukaemia, Liver disease, DIC
Raised D dimer/FDP	Haemolysis Coombs test Antibody titter	DIC Haemorrhagic diseases of new born Shock
Hb electrophoresis-Normal/Abnormal	Hereditary haemolysis	β Thalassaemia major ∞ Thalassaemia,Haemoglobin E Trait

NB: Teaching learning process is open and continuous process. Some model examples of clinical integrations of are given. Teachers will facilitate with their own way.

Distribution of teaching aids of small group teaching learning both in 3rd and 4th year:

Teaching aids of small group teaching learning in 3rd year	
Prepared stained (H&E & Leishman) slides	Acute appendicitis, Chronic cholecystitis Tubercular lymphadenitis, Nodular hyperplasia prostate, Rhinosporidiosis, Lipoma, Fibro adenoma, Dysplasia/carcinoma in situ (Cervix), Invasive squamous cell carcinoma, Grade 1, Cirrhosis of liver, Iron deficiency anaemia (Microcytosis), Megaloblastic anaemia (Macrocytosis), Neutrophilia, eosinophilia, lymphocytosis
Specimens	Acute appendicitis, Uterine leiomyoma, Osteosarcoma Lipoma
Equipment's and reagents	Jar with 10% neutral buffered formalin, Coplin jar with 95% alcohol Frozen section (Cryostat) machine, Core biopsy needle Ayers wooden spatula, Vacutainer, Reagent strip
Case histories	Thalassemia

Teaching aids of small group teaching learning in 4Th year	
Prepared (H&E, Leishman/immunstained) slides	Acute leukaemia /Chronic leukaemia, ITP (Thrombocytopenia), Glomerulonephritis Special stain -PAS, immunofloruscence Carcinoma breast- er/pr, her2/neu
Specimens	Acute appendicitis, Chronic cholicystitis with cholelithiasis Intestinal polyp, Multinodular goitre, Serous/mucinous, Ovarian cystadenoma ovary, Carcinoma breast, Adenocarcinoma colon/Stomach, Cervical carcinoma
Equipment's	Bone marrow aspiration needle, Trephine biopsy needle, Lumber puncture (LP) needle
Case histories	Rheumatic fever, Chronic bronchitis, Pulmonary tuberculosis Chronic osteomyelitis, Chronic Hepatitis, Diabetes mellitus. Peptic ulcer disease, Nephrotic/nephritic syndrome, Endometriosis, Hypertensive heart disease, Rheumatoid arthritis
Report interpretations	Hypercholesterolemia, Hyponatremia, Azometia, Hyperbilirubinemia Hyperglycaemia, Oligozospermia, Increased bleeding time, Raised D dimer/FDP, Hb electrophoresis-Normal/Abnormal.

Related Equipment's & Instruments:

- Bino-ocular and teaching microscope, microscope with projection in LED monitor/ Multi-head microscope, Computer.
- Centrifuge machine, Colorimeter, Spectrophotometer, Auto-analyser, incubator, Balance, water bath, Cell counter.
- Electrolyte and Gas analyser, ELISA reader, Haemocytometer, Haem meter, Wintergreen ESR tube, ESR stand.
- Ayer's spatula, Coplin's jar, Microtome, Cryostat machine, Core needle biopsy needle, Trephine biopsy needle, Lumber puncture needle etc.

Assessments:

A. There will be in-course/formative (item/card/term) and end-course/summative (professional) assessment for the students in each phase (1st, 2nd, 3rd & 4 phase) of the course i.e. formative and professional examination.

B. Formative assessment will be done through results of items, card and term ending examination, weightage from integrated teaching & class attendance.

C. For formative assessment, 10% marks of written examination of each paper of each subject is allocated.

D. In written examination for MCQ of each paper, 20% marks are allocated. Out of that Single based answer, (SBA) type of MCQ will be 50% and multiple true false (MTF) type of MCQ 50% in formative and summative assessment of all subjects of MBBS course. There will be separate answer script for MCQ part of examination. Total number of MCQ will be 20 for 20 marks out of which 10marks for SBA and 10marks for MTF.

Overview of examination system

- Formative assessment- Four cards (Pathology Card-I A Pathology Card-I B, Pathology Card-II A and Pathology Card-II B. Pathology Card-I A and Pathology Card-I B must be completed in3rd year. Students with unsatisfactory results in term/card completion examination will appear reassessment examination arranged by Phase II/ Phase III committee in reasonable period.
- Summative examination: Third Professional MBBS examination in Pathology will be as written, oral & practical. Summative Examination begins from First May of each year.

CLASS PERFORMANCE CARD-1A: GENERAL PATHOLOGY

Sl. No	Name Of The Item	Full Marks	Marks Scored	Signature/Remarks
01.	Introduction of pathology, Histo-cytopathological sample collections, preservation, transport and processing of pathological samples. An outline of autopsy,			
02	Techniques in Cytopathology- FNAC, Pap smear, fluid cytopathology,			
03.	Cellular adaptations: definitions, feature and clinical significance, Intracellular accumulation, calcification, Cellular Aging.			
04.	Cell injury: Definitions, injurious agents, types, reversible cell injury-features and morphology, Mechanism of hypoxic injury and Free radicals.			
05.	Irreversible cell injury-Necrosis & Apoptosis-features, example.			
06.	Inflammation: Definition, causes, cardinal signs, types, acute inflammation- cellular and vascular events; Chemotaxis, Phagocytosis.			
07.	Chemical mediators, morphological patterns of acute inflammation, outcome of acute inflammation, Systemic effects of inflammation.			

08.	Chronic inflammation: Definition, cells of chronic inflammation, Granulomatous inflammation – causes, examples and mechanism.			
09.	Healing and repair: Definition, types, mechanism, factors affecting wound healing, complications of wound healing.			
10.	Hemodynamic: Enema, effusions, Electrolyte disorders			
11.	Hyperaemia, congestion, Haemorrhage, Shock			
12.	Haemostasis, Thrombosis, Embolism, Infarction			
13.	Neoplasia: Definition, Nomenclature, Nature of tumor- Benign, Malignant, Borderline malignancy, Low malignant potential; Incidence & Predisposition.			
14.	Features of malignancy- Anaplasia, invasion, metastasis, Molecular aspect of tumour -oncoprotein, Oncogene, Tumour suppressor gene, cellular & molecular hallmarks of cancer.			
15.	Carcinogenesis- direct & indirect carcinogens, clinical aspects of cancer- cancer cachexia, paraneoplastic syndrome, Grading and staging of cancer.			
16.	Tumour immunity, laboratory diagnosis of cancer			

CLASS PERFORMANCE CARD 1B: GENERAL PATHOLOGY

SL NO	NAME OF THE ITEM	FULL MARKS	MARKS SCORED	SIGNATURE
1.	Genetics: Broad classification: Single Gene Disorders, Chromosomal disorders, Complex Multigene Disorder. Cytogenetic disorders- Down's, Turner's syndrome: Clinical features, Diagnosis Mutation: Definition, Types, examples. Common investigations to diagnose a case of genetic disease.			
2.	Immunopathology: Definition of immunity. Types of immunity immune disorder. Hypersensitivity, Autoimmune disorder-types, immunodeficiency disorder-types & cause, Rejection of tissue transplantation			
3.	Nutritional disorders: PEM, Obesity, Vitamins and Mineral deficiency, Childhood tumour and Environment hazards Effects of tobacco & alcohol; Occupation hazards: Arsenic, Radiation.			
4.	Infectious diseases-Pathogenesis and tissue changes: TB, Leprosy, Leishmaniosis, Rhinosporodiosis, Hepatic amoebiasis, Hydatid cyst.			
5.	Introduction and Terminology: Haematological sample collection, Preservation and processing. Constituents of blood and bone marrow, erythropoiesis, Types of Hb and RBC indices, PBF. CBC.			
6.	RBC disorder: Anaemia, Classification-etiological and morphological, etiopathogenesis and laboratory diagnosis of Iron deficiency anaemia and Megaloblastic anaemia.			
7.	Haemolytic anaemias: Classification: Extra corpuscular and intra corpuscular haemolysis, etiopathogenesis and laboratory diagnosis of Thalassemia, Sickle cell anaemia.			
8.	Pancytopenia, Aplastic anaemia- etiopathogenesis and laboratory diagnosis.			
9.	Reactive WBC proliferations- Neutrophil leucocytosis, Leukopenia, Neutrophilia, Eosinophilia, Lymphocytosis,			
10.	Blood grouping-Types, Blood products, Screening tests, Hazards of blood transfusion			

CLASS PERFORMANCE CARD-2A: SYSTEMIC PATHOLOGY

	FULL MARKS	MARKS SCORED	SIGNATURE
1. Leukaemia's and related disorders-Leukaemia, Leukaeomoid reaction. Subleukaemic leukaemia and Myelodysplastic syndrome			
2. Blood vessels: Atherosclerosis, vasculitis and tumours, Lipid profile.			
3. Ischemic heart diseases, hypertensive heart diseases and cardiac enzymes.			
4. Congenital heart diseases, Rheumatic fever, Infective endocarditis, (Myocarditis, Pericarditis, Cardiomyopathy-Types and causes), Diagnosis.			
5. Respiratory System: Congenital diseases, Inflammatory diseases-TB, Lung abscess, Pneumonia			
6. Respiratory System: COPD -Emphysema Chronic bronchitis, Bronchial asthma, Bronchiectasis, Bronchogenic carcinoma, Sputum examination.			
7. Urinary system: Congenital kidney diseases, clinical presentation of renal diseases, Glomerular diseases- AGN. NS.			
8. Urinary system: Tubulo-interstitial diseases, pyelonephritis, Renal calculi and Renal function tests			
9. Urinary system: Renal tumours & urinary bladder diseases-cystitis and urinary bladder tumours.			
10. Lymphoproliferative disorders: Lymphadenitis, Lymphoma-types, morphology of Hodgkin lymphoma and Non-Hodgkin lymphoma, Multiple myeloma			
11. Myeloproliferative disorders: Polycythaemia, Myelofibrosis			
12. Eye & ENT: Tumour, sinusitis, Otitis media. CNS: Inflammation- Meningitis, brain abscess, Brain tumours-Glial tumours and others; Criteria of brain tumours, CSF examination			
13. Bones: Inflammation-Osteomyelitis, Bone tumours classification-Osteosarcoma; Joints: Rheumatoid arthritis; Soft tissue: Soft tissue tumours			
14. Skin: Common terms, Inflammation, Blistering diseases, Pigmented skin lesions, premalignant & malignant conditions (SCC, BCC and malignant melanoma).			

CLASS PERFORMANCE CARD-2B: SYSTEMIC PATHOLOGY

	FULL MARKS	MARKS SCORED	SIGNATURE
1. GIT: Oral cavity, salivary gland- inflammation, classification of tumours (pleomorphic adenoma). Oesophagus-precursor lesions, risk factors and tumours			
2. Gastritis, Peptic ulcer diseases, gastric carcinoma.			
3. Small and Large intestine: Congenital diseases. Inflammatory bowel diseases. Polyps ulcers and Tumours of GIT. Acute appendicitis.			
4. Hepatobiliary: Acute and Chronic hepatitis Hepatitis-B & C viral markers, liver function tests.			
5. Hepatobiliary- Liver Cirrhosis, Portal hypertension, Hepatic failure & tumours.			
6. Gall bladder-Calculi, etiopathogenesis of cholecystitis, inflammation and tumours. Pancreas- Inflammation and tumours			
7. Male Genital System: Testis- inflammations and tumours: Semen analysis & Prostate- NHP. Tumours, PSA			
8. Female Genital System: Vaginal diseases- vaginitis, cyst: Cervix-cervicitis, polyps, CIN, Cervical tumours, PAP smear test.			
9. Female Genital System: Corpus of uterus-DUB, adenomyosis, endometriosis and uterine tumours; placenta; Ovary-cysts and tumours. Pregnancy test			
10. Breast- Inflammatory & fibrocystic diseases, benign & malignant tumours- epidemiology, risk and prognostic factors: Investigation protocols, IHC-ER, PR, HER-2			
11. Endocrine: Thyroid gland: Hypo and hyperthyroidism; Thyroiditis-Hashimoto's thyroiditis, Graves' disease. Tumours of Thyroid gland -Types, predispositions, prognosis. Diagnosis of thyroid diseases.			
12. Endocrine- Diabetes mellitus, Types, Pathogenesis, complications, diagnosis. OGTT, Benedict’s test.			
13. Normal, increased and lower values of different haematopathological and chemical pathology investigations.			

Pre-requisite for appearing in Term/card final examination:

- Student must complete all items of the card in that term.
- At least 75% attendance lecture, tutorial and practical classes, integrated teaching and generic classes which when applicable.
- Completion of the practical notebook, case reports or assignments of integrated teaching.
- Pre-term preparatory leave: Total 10 days, 5 days before each term examination.
- No space for post term exam leave.

Marks distribution in Term/Card final examination:

- Total marks- 300:

A. Written-90, Formative-10 marks

- **MCQ (20):** Multiple True/false 10. Single best answer 10
- **SAQ +SEQ: T**wo groups, each with35, total (35x2) =70.
- **SEQ: (Around 25%)**. Any two questions out of three. **6x2=12**
- **SAQ (Around 75%).** Any six questions out of seven. **3X6 =18**
- One problem based question **(Compulsory). 5**

B. Oral examination- Two board each with one chairperson and two members. Marks 50+50=100.

C. Practical examination: 100 marks: OSPE-50 marks +Traditional Practical 40 marks. Practical note book and case history-10 marks.

OSPE-Objective Structured Practical Examination-50 marks

- 10 OSPE Stations, 5 marks each
- 2 procedure stations and three question stations
- **Procedure stations**-preparation of 10% formalin for histopathology fixative, 95% ethyl alcohol as cytopathology fixative, focusing of histopathology slides with probable diagnosis, drawing of anticoagulated blood in the Wester green tube and its placement in the rack, Focusing of PBF for neutrophil, blast cell, pencil cell, target cell, nucleated RBC, schistocytes etc. Sending of histopathology specimen and fill up the requisition form, Transport of histopathology slide to nearest hospital, Transport of FNAC or Pap's smear to nearest hospital, preparation of a peripheral blood film (PBF), Preparation of thin and thick blood film for detection of Malarial parasite, Performance of Benedict's test for reducing sugar and heat coagulation test for protein, centrifuge body fluids (CSF, Pleural fluid, Peritoneal fluid)

Question stations:

Gross specimen- for identification, description and probable diagnosis, Instrument-bone marrow needle with indication, Microtome blade(disposable), Ayer's spatula, Kopplin jar with alcohol, vacutainer, Tissue cassette, 20 cc syringe, paraffin block, Test tube and its use, Benedict reagent, Earaches albumin meter, Micropipette and its use, H&E stained slide

for identification of stain, Pap's stained slide for identification of stain, Immunohistochemistry slide/photograph, for identification, Microtome and its use, Frozen section machine/ photograph, semiautoanalyzer/photograph, Touch imprint. centrifuge machine, cytosine. Core needle for biopsy, Trephine biopsy needle. Photograph with immunostaining and special stain (PAS)

Third Professional Examination

Subjects	Written Exam marks	Structured Oral Exam marks	Practical Exam marks	Formative Exam marks	Total Marks
Community Medicine & Public Health	90	100	100	10	300
Pathology	90	100	100	10	300
Microbiology	90	100	100	10	300
Total					900

Summative Examination:

a) 10 marks of formative assessment will be added to the written marks of 3rd professional examination.
b) For MCQ (MT/F+SBA), 20 marks are allocated.
c) For SAQ & SEQ, 70 marks are allocated.
d) Oral part of examination will be structured.
e) OSPE will be used for assessing skills. OSPE will be centrally arranged by the Dean Office to increase the competency of practical knowledge in all institutions.
f) Pass mark in examination is 60% of total marks. Student will have to pass in written, oral and practical separately.
g) The result will be published as per following GPA system with the provision of reflection of marks in the academic transcript.
h) Revision Classes and preparatory Leave for 3rd Professional MBBS Examination: Total 30 days preparatory leave shall be granted to students before third Professional MBBS Examination viz. 1st April to 30th April.
i) Certain percentage of marks from different components of formative assessment to add in summative assessment of 3rd Professional MBBS examination.

Pre-requisite for appearing in 3rd professional examination.

i. Students must pass all term final examinations both in 3rd and 4th year. If a student fails in a term examination, he/she will have to pass the supplementary examination.

ii. 75% attendance in general classes (lecture, tutorial and practical) separately both in 3rd and 4th year are mandatory.

iii. Attendance in generic topic and integrated teaching are mandatory.

iv. Submission of two assignments on integrated teaching is mandatory.

v. Each student will submit five complete case histories.

vi. Submission of two practical notebooks (each comprising maximum 10 topics) is mandatory.

vii. Obtaining at least 6 marks in formative examination.

Calculation of Formative marks. Total mark: 10

Average marks obtained in four Term/card final examinations: 05 marks

- 75% and above -5 marks.
- 65 % to 74 % -4 marks
- 60 to 64% -3 marks

For general class attendance (Lecture, tutorial and practical separately): 03 marks. Shall be calculated as follows:

- ≥ 90% : 3 marks
- 75-89% : 2 marks
- < 75 % : No mark (not eligible).

Mark for attending integrated teaching and for generic topics: 2 marks

- > 90% (2)
- 75 to 89%(1)
- <75% not eligible

Lowest marks of calculation:

- Lowest marks in Term examination: 03 (Average 60% marks)
- Lowest marks in class attendance: 02
- Lowest marks for integrated teaching and generic topics: 1

So, lowest marks of formative assessment for 3rd professional MBBS examination in Pathology is 06. Marks for integrated teaching and generic topics is compulsory.

Without scoring this 06 marks including marks for integrated teaching and generic topics, students will not be eligible.

Example: A student secured 78% in total in best two Term examinations, and has 80% attendance and completed all the items examinations timely, his/her Formative assessment marks will be as follows:

For 75% marks on average=5

- For 80% attendance=2
- Mark for integrated teaching and generic topics: 1+1 marks
- He/she can get 9 out of 10.
- A student will not be allowed to appear in more than two items examinations per week. If any student remain absent on that day for illness or any valid reason, he or she may be allowed to give pending item examinations with the permission from Head of the Department of Pathology. He or she must produce documentary evidence for his or her absence to the Head of the Dept. of Pathology.

Marks distribution:

Total marks- 300:

A. Written-90, Formative-10 marks

- **MCQ (MTF, SBA):** Multiple True/false 10. Single best answer 10. Total 20.
- **SEQ+ SAQ: Four** groups, each with 17.5 marks. Total 70.

Each Group (A, B, C, D)

- **SAQ (Around 75%).** Any three questions out of four. **3X3 (09)**
- **SEQ: (Around 25%)**. Any one questions out of two. **6x1 (06)**
- One SAQ in the form of problem based question **(Compulsory)- 2.5**

B. Oral examination: 100

Structured (SOE)

- Two board each with one internal one internal.
- Marks 50 for each board (Total 100).
- Convener will be selected by the Dean of faculty of Medicine and 25 marks for each member of the board.

C. Practical examination: Total marks- 100. Pass marks-60%

OSPE-50 (Pathology Card-I A& B)

Pathology card-1 A&B:25

Slides-2 (2x5=10)

Figures, data interpretation- 1 (1X5=5)

Instruments, reagent, miscellaneous =2 (2x5=10)

Pathology Card-II A&B:25

Slides-2 (2x5=10)

Museum specimens- 2 (2x5=10)

Instruments, reagent, miscellaneous=1 (1x5=5)

Traditional practicals-40 marks

Practical note book and case history-10 marks (5 for two practical note books and 5 marks for 5 case histories and 2 Integrated assignments))

Result should be published in "grading" system

Numerical grade	**Letter Grade**	**Grade point**
80% and above	**A+**	**4.00**
75% to less than 80%	A	3.75
70% to less than 75%	A-	3.50
65% to less than 70%	B+	3.25
60% to less than 65%	B	3.00
Less than 60%	F	0.00

Question setting:

Total number of paper setters must be at least 10 in 5 groups.

a) Group "A" two paper setters for MCQ, SEQ and SAQ.
b) Group 'B" two paper setters for MCQ, SEQ and SAQ
c) Group "C" two paper setters for MCQ, SEQ and SAQ
d) Group "D" two paper setters for MCQ, SEQ and SAQ
e) Group "E" two paper setters for central OSPE

Moderation:

Total number of moderators must be four- two for MCQ and two for SAQ and OSPE. For central OSPE, questions after moderation will be scented in separate envelope along with the MCQ and SAQ questions.

Topics for SAQ for written examination in 4 groups:

- **Group A**: Cell injury and adaptive changes, inflammation and repair, Neoplasia, Acid base disorders.
- **Group B** Hemodynamic derangement, Erythropoiesis and anaemias, reactive WBC disorders, bleeding disorders, genetics, vitamins and nutrition, environmental injuries.
- **Group C**: Leukaemia's and myeloproliferative disorders, lymph reticular system, CVS and cardiac enzymes, lipid profile Respiratory system, Urinary system, urine analysis and RFT, bones skin soft tissues, CNS and CSF.
- **Group D**: GIT, Hepatobiliary system and LFT, Male and female genital system, Semen analysis, Endocrine system, Hyper-hypoglycaemia and diagnosis of diabetes mellitus,

MCQ:

- 1st 30 minutes within 3 hours of written examination.
- MTF type and SBA each 10 (50%) in number of total 20.
- Total marks -20, each question will carry 1 mark.
- Each question will consist of 1 stem and 5 branches.
    - •Each SBA type question will carry 1 mark (Only one alternative is to be chosen).
- For MTF, each branch will carry 0.2 marks.
- No negative marking.

SBA (Single Best Answer) type MCQ:

- SBA is a MCQ having a "stem" (a scenario, a sentence, complete or incomplete, or a figure) followed by a "Lead in" sentence, if necessary.
- It includes a list of possible answers among which only one is the "Best". The candidate should select Correct/Best/Appropriate response from 5 possible answers.
- As Pathology is a basic subject it is sometimes difficult to construct all correct alternatives. Therefore, single correct answer (SCA) type questions are also allowed.

Model question with scenario:

A 30 years lady came with uncontrolled per vaginal bleeding and altered consciousness. She had a history of childbirth following prolonged obstructed labour three days back. On examination her BP was 80/40 mm Hg, rapid thread pulse and bleeding from multiple sites of the body were found. The appropriate diagnosis is---

a) Disseminated intravascular coagulation

b) Hypovolemic shock

c) Idiopathic thrombocytopenic purpura

d) Postpartum haemorrhage

e) Septic shock

Key: a

Model question: Single Correct Answer type:

Histopathological hallmark of tuberculosis is-

a) Caseous necrosis

b) Epithelioid cell

c) Fibroblast

d) Granuloma

e) Langham's type giant cell

Key: a

MT/F type MCQ:

- In this type of MCQ, a "stem" is followed by five branches. Each of these branches can be either true or false in relation to the stem. Mark allocated in each branch is 0.2 in our system.
- Variable proportion of true or false branches is allowed. However, no question should be regarded as MT/F if there is only one true response.

Model question:

Normoblastic macrocytic anaemia occurs in:

a) Alcoholism

b) Haemolytic anaemia

c) Liver disease

d) Non vegetarian person

e) Pernicious anaemia

Key: a, b, c

Short Answer Question (SAQ):

- This type of questions may be of many varieties, including open SAQs, fill in the gaps, label or draw diagram, unique answer, numerical etc.
- In our question papers, SAQ would mean mostly open ended questions, where answer of one to several sentences has to be created.
- A closed ended question may also be asked.
- We can also use the other variety of SAQs in different combinations.

Examples of SAQs

Q1. What is necrosis? Write down the differences between necrosis and apoptosis. (1+2)

Q.2. How oedema due to lymphatic obstruction occur? List three possible causes of oedema due to lymphatic obstruction (2+1)

Q3. What is hyperplasia? What are the differences between endometrial hyperplasia and endometrial atrophy? (1+2)

Q.4. What is cryptorchidism? List four causes of testicular atrophy (1+2).

Q.5. What are the differences between dysplasia and carcinoma in situ? How premalignant conditions of cervix can be diagnosed early? (2+1)

Q.6. What is wound healing? List four local causes of delayed wound healing. (1+2)

Q.7. Why wound healing is delayed in diabetes mellitus? What are the complications of wound healing? (1+2)

Structured Essay Question (SEQ)

- Each SEQ is actually derived from an essay question where a broad topic is dealt with. However, for making the different issues (under the same topic) expected to be covered in the answers more specifically, the question may structured as several SAQ
- Each group, one SEQ carrying 6 marks with an alternative is given.

Examples of SEQ:

1. Write down an essay on laboratory diagnosis of tumour.
2. Explain the role of macrophage in inflammation and repair.
3. Mention the laboratory diagnosis of DM with their potential limitations.
4. Describe the pathogenesis of cervical carcinoma
5. “Glomerular diseases are mainly immune mediated” Explain

Distribution of written script among the examiners:

- There will be four examiners- two internals & two externals.
- Each of the examiners will examine any one group of written script.

Model Problem based questions

Q1. A female of 29 years has presented to you with a palpable mass in her left breast. The lump is movable, well circumscribed, not fixed to skin or areola. Ultra sonogram reveals a solid lesion. What is your probable diagnosis? How will you proceed to diagnose such a patient? (1 +1.5)

Q.2. A 15-year-old girl presented with colicky periumbilical pain that localized later on to right iliac fossa. Local examination reveals tenderness and muscle guard on palpation. Her full blood count reveals neutrophil leucocytosis. What is your probable diagnosis? (2.5).

Q3. A 65 years old man with diabetes mellitus suddenly, became unconscious and brought to the emergency room of a nearby hospital. His relatives gave the history of poorly controlled diabetes. His urine was collected by catheterization. The urine smells sweetish. What could be the possible cause for his unconsciousness. What test would you like to advise for his diagnosis? (1 +1.5)

Q.4. A 40 years man presented with severe anaemia. His haemoglobin was 5gm/dl, ESR-100 mm in 1st hour, PCV was reduced, TC of WBC was 1500/cu mm of blood, peripheral blood film showed pancytopenia. What could be the possible diagnosis? How will you confirm it? (1+1.5)

B. Viva (Structured Oral Examination)

There must be two boards (I&II). Each examinee will face two boards and twenty boxes, ten boxes in each board. Each board will comprise of two examiners (1 internal +1 external). The Student will be asked to collect one card from each box. Both the two examiners of a board will give marks individually for all the 10 box for a examinee. The board content should be changed on every two days. The total marks will be combined marks of two boards. Pass marks is 60% combined (Board-I and Board-II).

Contents of Board I and Board II

- Board I: Boxes A1 to A10
- Board II: Boxes B1 to B10

Pattern of question of SOE:

- Recall-35%
- Understanding 35%
- Problem based /Analytical 30 %
- In each day maximum 12 students will be scheduled for oral and practical examination.
- Each student will face in the same day both oral and practical examination except OSPE.

ORAL EXAMINATION BOX CONTENTS: GENERAL PATHOLOGY

A/1	A/2	A/3	A/4	A/5
Cell injury Cellular adaptation, Necrosis and apoptosis, Intracellular accumulation and pathological calcification	Inflammation, Healing and regeneration, Infectious diseases Paraproteinaemia	Enema, Electrolyte disorders, Thrombosis and Embolism, Hyperaemia and Congestion, Shock, Haemorrhage, Infarction, Examination of body fluids	Neoplasia: Terminologies Classification – as histology and as clinical behaviour. Aetiology, molecular basis, tumour biology Clinical effects, paraneoplastic syndrome Diagnosis Tumour marker Childhood tumours	Problem based question on Items of General Pathology Staining, Histopathology slides Biopsy FNAC Frozen section Immunohistochemistry

ORAL EXAMINATION BOX CONTENTS: GENERAL PATHOLOGY

A/6	A/7	A/8	A/9	A/10
Environmental and Nutritional deficiency disorders Haemopoietin, Etiopathogenesis ,lab diagnosis of iron deficiency anaemia and Megaloblastic anacmia	Genetic disorders: Classification, Mutation, Diagnostic tools Etiopathogenesis and lab diagnosis of Haemolytic anaemia, Aplastic anaemia,	Infectious diseases paraproteinemia Immunopathology Hypersensitivity, Autoimmune disease, Immunodeficiency states WBC disorders- Granulopoiesis Reactive disorders Leukaemia and related disorders	Haemorrhagic disorders Blood grouping and cross matching Blood transfusion products Transfusion reactions	Problem based questions on Haematolymphoid Pathology Practical Anticoagulants Hb estimation, ESR, CBC, PBF, BT, CT, PT, Platelet count, Reticulocyte count, Coomb's test Bone marrow examination, Trephine biopsy

ORAL EXAMINATION BOX CONTENTS: SYSTEMIC PATHOLOGY

B/1	B/2	B/3	B/4	B/5
Atherosclerosis, Tumours of blood vessels ischaemic heart diseases, Infective endocarditis, Myocarditis Pericarditis Rheumatic fever: Pathogenesis, morphology and complications Lipid profile Cardiac enzymes	GIT: Peptic ulcer diseases, Ulcers and tumours of GIT, Diarrhoeal diseases Inflammatory bowel diseases Salivary gland Endoscopic biopsy, Colonoscopy	Hepatobiliary system Viral hepatitis, Cirrhosis of liver, Hepatocellular Carcinoma Jaundice and Liver Function Tests Breast; Inflammation and tumours, Risk and prognostic factors, Diagnostic protocol of breast lump Pregnancy test	Urinary system: Primary glomerular diseases, AGN, Nephrotic syndrome, Pyelonephritis, Renal stone, Tumours of kidney and urinary bladder, Causes of uraemia, proteinuria Haematuria and Ketonuria Renal function tests Urine examination	Case history: Specific basic pathogenesis of the diseases of cases taken and Common investigations to diagnose diseases of that system. Histopathological Specimens: Pathologically significant naked eye findings of the specimens and their examples in clinical conditions of different systems.

B/6	B/7	B/8	B/9	B/10
Respiratory system Pneumonia, Pulmonary Tuberculosis, COPD, Bronchogenic carcinoma, Bronchial asthma Pleural fluid Examination	Male genital System: Testicular tumours, Nodular hyperplasia and tumours of Prostate, Semen analysis Female genital System: Cervicitis, CIN, Cervical carcinoma Tumours of body of uterus and ovary, endometriosis	Endocrine system Hypo and hyper thyroidism Hashimoto thyroiditis, Tumours of thyroid gland Diabetes mellitus And complications Myeloproliferative disorders Polycythaemia, Lympho-proliferative disorders: Lymphoma	CNS, Eye, ENT, Skin Musculoskeletal system, Bones, Joints and soft tissue tumours Examination of CSF fluid	Problem Based questions of Systemic Pathology Integrated teaching

Rating Scale for SOE

3rd Prof Exam --- **Date:**

Total marks - **Time for each student: …….**

Roll No	Card/set No	Scoring of the answers										
		Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Total Score
1.												
2.												
3.												
4.												
5.												
6.												
7.												
8.												
9.												
10.												
11.												
12.												

For example: If a student is asked the question" What is granuloma? Tell six causes of granulomatous inflammation (2+3)

1. If the student can answer definition only-score-2
2. If the student can answer definition and one important cause-score-2.5
3. If the student can answer definition and two important causes but one wrong cause-score- 3
4. If the student can answer definition and three important causes but no wrong cause-score-3.5

5. If the student can answer definition and four important causes with nothing wrong with one supplementary question on granuloma-score-4
   (The student may be asked whether granuloma of sarcoidosis is caseating or non-caseating? or How can you diagnose a case of granulomatous inflammation?)

6. If the student can answer definition and five important causes with two supplementary questions on granuloma-score-4.5
7. If the student can answer definition and six important causes with at least two supplementary questions on granuloma and all the answers are full correct-score-5
   (The student may be asked pathogenesis of immune granuloma & morphology of an epithelioid cell or Langham's type giant cell or differences between inflammatory giant cell and neoplastic giant cell)

8. If the student can not answer definition but can give two to six examples only-score-1-2
9. If the student cannot answer definition but can understand granuloma as a specific form of Chronic inflammation-score-1
10. If the student can answer definition but cannot understand whether it is a acute or chronic inflammation or neoplasm or granulation tissue-score-1 (confused)
11. If the student does not know the answer-score-0. If the student give wrong answer-score-0

OSPE- Objective Structured Practical Examination

- Number of station- 10 (5 stations should be selected from Pathology-Card I A&B contents and 5 stations from Pathology-II A&B contents)
- Allocation for time for each station- 3 minutes (3x10-20 minutes
- Allocation of marks in each station- 5. Fractionation of marks should be avoided. 0.5 marks or above will be considered as 1 mark and less than 0.5 mark or above will be considered zero.
- Number of procedure stations- 4 to 5. Number of question stations- 5 or 6.
- In the question station, some questions should be based on the information obtained at previous station.
- Figure and models can be supplied in OSPE taken from Pathology card-I (A,B) and Pathology card-II(A,B) contents. Two procedure stations (5x2=10 marks) will be arranged in the morning of viva/practical examination.
- All the twelve candidates should start OSPE at a time, so two extra gap stations should be kept for them. The last two candidates will get extra 4 minutes (2+2) to complete the rotation.
- The examiners stays at the station while the students move from station to station.
- If necessary, the teachers of the respective department may be posted at procedure station with the checklist provided.
- Ali students are assessed on the same set of questions on that day. Set of question will be changed on subsequent days.
- Answer scripts of OSPE will be evaluated by four examiners.

- OSPE should start first on the specific day of oral and practical examinations.
- Allocation of time should be flexible i.e., 2-5 minutes can be proposed. Because some procedures may take 5 minutes to be completed.
- In each question station, a student should drop his/her answer in the box provided carefully writing his/her roll number. Checklist of the procedure station will be with the observer.
- A question bank on OSPE should be created in Dean's office so that standard of OSPE stations can be maintained. Respective Head of the departments can take the responsibility to collect those OSPE questions before the oral and practical examination of 3rd Professional MBBS examination on Pathology.
- After OSPE, traditional practical should start and students will be called for oral examination on the basis of examination roll numbers and first half will go to Board-I and second half will go to Board-II and vice versa.

Examples of OSPE:

Procedure station

Q.1. Slide- A female of 48 years. Section from thyroid nodule (total marks- 5).

Checklist:

a. Student properly placed the slide under microscope- (mark-0.5); if not successful- (mark-0)
b. Student properly adjusted the slide under microscope- (mark- 0.5); if not successful- (mark-0)
c. Identified the structure properly under microscope with two identifying points (mark-2), if not correct- (mark-0)
d. Diagnosed correctly the supplied slide- (mark- 2); if not correct- (mark- 0).

Question station (mode)

Q.1. Sample- Gall bladder with stones (total marks-5)

a. Question- Identify the specimen and give your probable diagnosis (marks-14)
b. Question- Write down two histopathological changes likely to be present in it-(marks-2).
c. Write down two possible complications of it (marks- 2)

Procedure station

Q.4. A vial containing blood mixed with proper anticoagulant has been provided. Do the procedure for estimation of ESR by Wintergreen method. Question: What is the normal value of ESR in an adult male estimated by this method (5)

Checklist for the examiner (please circle):

a. Blood drawn into the ESR tube properly (by the dropper/sucker provided)- Yes----No
b. Blood drawn up to mark 0 in ESR tube- Yes----No
c. Blood filled ESR tube is placed in the stand upright- Yes----No
d. Time of estimation mentioned (1 hour after placement or ESR tube in stand)- Yes----No

Central OSPE Module for MBBS curriculum-2021

- OSPE examination will be held in the **same day and time** at each examination centre under the University.
- The University will announce a schedule date and time for OSPE examination.
- OSPE questions will be invited from question setters and moderation to be done by teachers appointed by the University.
- OSPE questions will be supplied to the examination centres by the University accordingly.
- OSPE questions will be in photograph/print matter etc.
- There will be 08(eight) question stations and each station will be allowed 03(three) minutes time and total time for OSPE examination is 8x3= 24minutes.
- Each question will carry 05(five) marks and total marks of OSPE will be 5x8=40.
- Five marks of each question may be done into sub fragments and mark distribution accordingly.
- Suggested question pattern/format is –
    a) Photograph of two histopathology slides – 2x5= 10
    b) Photograph of two slides of hematolymphoid system- 2x5= 10
    c) Photograph of two museum specimens/instruments - 2x5= 10
    d) Scenario based question/ normal values of biochemical tests- 2x5=10

10. Two procedure stations (5x2=10 marks) will be arranged in the morning of viva/practical examination.

Traditional practical (Total marks-40)

- Practical examinations will be conducted by the four examiners.
- Unstained slide for staining and comment on PBF or ESR estimation by Wintergreen method may be given (marks- 8x1=8)
- Stained PBF for comment-1 (marks- 5x1=5)
- Histopathology slides- 2 (marks- 8x2=16).
- Data interpretation-1 (marka-5x1=5)
- Urine (pus cells, RBC, casts/crystal may be focused)- (marks- 2)
- Perform Benedict test for sugar/ heat coagulation test for albumin in urine and give interpretation- (marks- 4)

Practical examination: Marks distribution

OSPE (10 stations)	50
Two practical notebooks	05
Case report (total 05)+ Integrated assignment (total 02)	05
Traditional	40
Total	**100**

Practical Note Books and Case History- Total marks-10

- Practical note book should be completed and properly signed during practical classes.
- Marks will be given on the basis of regularity of experiments done and cleanliness. Teachers of the respective tutorial batch will ensure that the practical note books and case reports are submitted before each Term examination.
- Students should submit it to the convener for marks during 3rd Professional MBBS Examination (practical examination) in Pathology.

Writing a histopathological requisition form

…… . Medical College, Dhaka

Department of Pathology
Histopathology Requisition Form

Hospital Reg no. …..
Patient's name : ……. Age : …….. Months ……. Years Sex : Male/ Female
Cabin/ Ward/ OPD : ……. Unit : …….
Ref by : ……..
Specimen : …….. Site of Biopsy :
……..
Operative findings :
……
……
……
……

Relevant clinical history :
……
Contributory findings (If any) :
…….....

a) X-ray
b) USG
c) CT scan/ MRI
d) FNAC/ Others

Clinical/ Provisional diagnosis :
……

Signature of the doctor
Date :

Preparation of mark sheets (2" Professional Examination) envelope for tabulation.

1. **Formative assessment:** Formative assessment Marks should be sent to the Deputy controller of Examinations and Two tabulators of respective University by the convener in a separate mark she: signed by all four examiners. It must be shown to external examiners during beginning of 3rd Professional MBBS Examination (oral and practical part). The marks of formative assessment should be recorded properly in a record book and also computerized if possible.

2. **Summative assessment:** Written examinations: SAQ mark should be sent to Deputy controller of examination and two tabulators of respective University separately by the four examiners.

Distribution of SAQ script to examiners: Keys must be Provided by convener in a sealed envelope and distributed to the following examiners.

- Board-I-Internal examiner will receive SAQ of Group-A
- Board-1-External examiner will receive SAQ of Group-B
- Board-II- Internal examiner will receive SAQ of Group-C
- Board-II-External examiner will receive SAQ of Group-D
- MCQ: MCQ answer scripts will be checked by OMR centrally at Dean's office.

3. Oral examinations:

- Oral Marks of Board I +Marks of Board II =total oral marks.
- This total oral marks should be sent to Deputy Controller of Examinations and Two tabulators of respective University by the convener signed by four examiners.

Practical examinations:

- Marks of OSPE +Traditional practical +Practical note books +case history =Total practical marks.
- This total practical marks should be sent to Deputy Controller of Examinations and Two tabulators of respective university by the convener signed by four examiners.

The tabulators and controller of examination will receive small sealed envelopes containing marks of

- Formative marks-three sealed envelope from convener signed by four examiners.
- Oral marks - three sealed envelopes from convener signed by four examiners sealed envelopes from convener signed by four Practical marks- three examiners.
- SAQ marks three sealed envelopes from each of four examiners of four Groups (Group A, B, C & D)

----------Medical College.

3rd Professional MBBS Examination of ----------200

Subject: Pathology

Evaluation of Pathology

3rd Professional MBBS Examination

Components	Marks	Total marks	
1. Formative assessment	10	10	
2. Written examination MCQ SAQ	 20 70	 90	Total written Number = 100 (FA+MCQ+SAQ) (10+20+70) (Pass marks-60)
3. Practical examination • OSPE • Traditional • Practical note Books + case histories+ Integrated assignments.	 50 40 10	100 (Pass marks - 60)	
4. Oral examination (Structure oral examination) • 2 board • 4 examiners • 2 internal • 2 external	50+50	100 (Pass marks - 60)	
	Grand total	300	

After completion of examinations (oral & practical) and examining the answer scripts, it is the responsibility of the convener (Head of the Dept. of Pathology of that centre) examiner to send the properly marked and sealed mark sheets to the Deputy Controller of examinations and Two tabulation of respective University as early as possible.

Checklist before sending the marks:

1. Top of each mark sheet should be filled up properly (name of the examination, part-oral/practical/written - paper & group/SAQ/MCQ, total marks of 3rd Professional MBBS examination, subject - Pathology, written SAQ group - A, total marks - 17.5 etc.)
2. Roll number should be written serially.
3. Examinees who are absent must be mentioned against their roll numbers.
4. Use of white fluid is prohibited.

5. Any overwriting should be avoided.
6. Any pen through/alteration on the mark sheet should be avoided.
7. Each page of mark sheet must be signed by the four examiners except in SAQ.

Envelope:
The following points should be mentioned on the envelope

Name of the examination
Centre of examination
Subject: Pathology
Oral/practical
Written-formative
Group
SAQ
All the envelope must be sealed and duly signed by the examiner with date and name with designation. Oral, practical and formative mark sheets should be signed by all the four examiners and similarly the envelopes are also to be signed by the four examiners.

Recommendations

Issues we need to give emphasis:
Junior as well as senior teachers will involved with small group teaching of tutorial and practical class.

- A supervisory committee should be formed to observe the proper conduction of examinations in different centres.
- There should not be the much variation in marking (ideally the difference should not exceed 10%) in viva examination.
- More emphasis should be given to predispositions, pathogenesis and diagnostic tools in systemic pathology.
- **Central OSPE will be arranged and questions will arrange from central question bank.**
- Check list with breakup of marks for the procedure station which will be arranged in the morning of viva/practical examination. There should be a central bank or central questions for SOE.

In 3rd year (Term 1A and 1B), practical learning will be more based on microscopic slides, instrument, problem based topics.

In 3rd year at least 4 lectures and 2 tutorial classes may be taken may be taken by Department of Pathology to teach "Forensic Pathology" in favour of Forensic Medicine Department from their schedule.

In 4th year (Term 2 A and B) learning will be more based on specimens, case history, instruments, report interpretation, problem based.

In each day maximum 12 students will be scheduled for oral and practical examination.

Multi head microscope/microscope with LED monitor and multimedia must be ensured in all Medical colleges for effective learning.

Small group, student centred problem based teaching for better understanding and to develop skill.

Specific emphasis to proper evaluation of practical (Central OSPE, Traditional) examination.

Eligibility for Term and Professional examination will be based on separately for class attendance, integrated teaching, each Term/Card and each year (3rd and 4th year)

More weightage (30%) of problem based questions in viva examination.

More question setters (1o) and more numbers of moderators (4) will be involved.

Microscopic morphology of systemic pathology and bone marrow (Seminoma, megaloblast) as well should be avoided in.

We need to make accustomed the students with the advanced techniques like uses of strips for chemical analysis, special stains in biopsy, immunohistochemistry and common molecular techniques to diagnose genetic diseases.

Good connectivity and sharing is necessary to improve the overall situation. •**Faculties, respected teachers of Pathology and concerned will discuss and evaluate the teaching learning situation as well as the assessment throughout the country in every three months.**

Comment: This is a draft of the operational module for Pathology. Hopefully will be finalized after necessary correction in earliest possible upcoming days.