OPERATIONAL MANUAL OF MBBS CURRICULUM 2012

SUBJECT : PATHOLOGY

Developed By-

Bangladesh Academy of Pathology
In collaboration with
Centre for Medical Education (CME)
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Mohakhali, Dhaka-1212
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Acknowledgement

Curriculum is a dynamic thing it is not static. To implement that curriculum all concerned such as teachers, students, policymakers to be more dynamic, should run smoothly with the time with 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.

The enormous task for developing this operational manual on Pathology of MBBS curriculum 2012 was firstly done by Bangladesh Academy of Pathology in consultation with Faculty of Medicine, Dhaka University. The Bangladesh Academy of Pathology then shaired the draft with CME. In collabotion with Bangladesh Academy of Pathology Centre for Medical Education (CME) organized a meeting with the heads of the department of pathology of different medical colleges of Dhaka and around due to fund constraint. Core group comprising members from CME and Bangladesh Academy of Pathology faniallised this manual. I express my gratitude to the Dean, Faculty of Medicine, Dhaka University and all other persons for their all cordial co-operation, guidance all the ways since beginning up to the completion. I would like to acknowledge Professor Dr. Md. Humayun Kabir Talukder, Professor (Curriculum Development & Evaluation), Centre for Medical Education (CME) & Dr. Tahmina Nargis, Assistant Professor (Medical Education), CME for there efforts in co-coordinating this activity without which it would be difficult to complete this work. I am grateful to all, who actively participated in this great job, specially the faculty members and staffs of Centre for Medical Education who worked very hard and efficiently to develop this operational manual of MBBS Curriculum for Pathology.

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Common Information & Activities of Phase III

1.1. 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) Third Professional MBBS examination to be started on first working days of May and November of each year.

iii) Time for integrated teaching, exam, and preparatory leave of formative & summative assessment is common for all subjects of the phase.

iv) Assessment:

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

1.2. Distribution of teaching-learning hours/days in 3rd Phase

i. Distribution of hours

Subject	Lecture (hrs)	Tuto-rial (hrs)	Practical (hrs)	Total Hrs	Formative Exam Term I & Term II		Summative exam (3rd Professional MBBS exam)	
					Preparatory leave	Exam time	Preparatory leave	Exam Time
Pathology	100	110	18	228	5 + 5 =10 days	10 +10 =20 days	10 days	15 days
Microbiology	100	45	45	190				
Pharmacology	100	30	50 +20 (cl. Phar)	200				
Total	300	175	143	618				

ii. Schedule of Term ending Examination

Term I	First Term exam			Term II	Second Term exam		
	Preparatory leave	Written	Viva		Preparatory Leave	Written	Viva
Duration: 1st July to 15th November = 18weeks	1st November to 5th November = 5days	6th November to 10th November	11th November to 15th November	Duration : 16th November to 30th March = 18 weeks	16th March to 20th March = 5 days	21st March to 24th March	25th March to 30th March

1st and 2nd Term examination: Marks distribution-total marks-200 in each term examination

a) Written-100 marks (SAQ-80 marks+MCQ-20 marks)

b) Oral examination-One board-(One chairperson of the board + two members)-50 marks

c) Practical examination-50 marks (OSPE-25 marks+Traditional Practical 20 marks+Practical Khata and case history-5 marks(3 for practical khata+2 marks for 4 case histories)

- **OSPE**-Objective Structured Practical Examination-25 marks
  - 5 OSPE Station-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 ant coagulated blood in the Westergreen 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, RBC and WBC pipette for

their use and identification of parts, Neubeaur counting chamber and its use, hemoglobinometer, Westergreen ESR tube, Wintrobe haematocrit tube, Microtomy blade(disposable), Ayre's spatula, Koplin jar, Tissue cassette, 20 cc syringe, paraffin block, Test tube and its use, Benedict reagent, Esbachs albuminometer, Micropipette and its use, H&E stained slide for identification of stain, Pap's stained slide for identification of stain, Immunohistochemistry slide for identification, Microtome and its use, Indications of frozen section, Touch imprint. centrifuge machine, cytospin. Glass slide and coverslip etc.

- **Traditional practical examination** in Term examination:Marks-25 (50% of below mentioned items can be given)

For Term-I(Traditional practical marks-25)

- Unstained slide for staining followed by PBF with comment or haemoglobin estimation or ESR estimation may be given (marks- 6x1=6)
- Histopathology slides- 2 (marks- 6x2=12) (Compulsory)
- Data interpretation on acid base imbalance-2

Practical khata and case histories(3+2(four case histories)=5

For Term -II (Traditional practical examination-25)

- Histopathology slides-2(6x2)=12 marks
- Cytopathology slide(Pap's smear)-2marks
- Urine (pus cells, RBC, casts/crystal may be focused)- (marks- 2)
- Perform Benedict test and heat coagulation test for sugar and albumin in urine and give interpretation- (marks- 2+2)

Practical khata and case histories(3+2(four case histories)=5

1.3. Duration of Each Term

i) Term I: 1st July to 15th November.

- Classes will be from 1st July to 31st October.
- First term preparatory leave: 1st November to 5th November.
- First term Exam: 6th November to 15 th November

ii) Term II : 16th November to 30th March

- Classes will be from 16th November to 15th march
- Second term preparatory leave: 16th March to 20th March.
- Second Term Exam: 21st March to 30th March.

1.4.Overview of examination system

- **Formative assessment-** Two cards (Pathology-I and Pathology-II) must be completed before Term-II examination. If any one fails in Term-I examination, he or she may be allowed to appear in that reassessment examination after the tenure of Term-I and if anyone fails in Term-II, immediately after Term-II examination. No student will be allowed to appear in any reassessment examination covering absence in both term examination. He or she must have to attend at least one Term examination timely.

- **Summative examination :** Third Professional MBBS examination in Pathology will be as written, oral & practical. Summative Exam: Begins from First May of each year.

1.5. Leave

Following leaves will be granted to the students :

a. **Pre-term preparatory leave :** Total 10 days, 5 days before each term examination viz. 1st November to 5th November before first term examination and 16th March to 20th March before second term examination.

b. **Post-term :** No space for post term exam leave.

c. **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.

1.6 Calculation of certain percentage of marks from different components of formative assessment to add in summative assessment (3rd Professional MBBS examination)

Academic performances of the students should be properly documented.

Calculation of Formative marks

- **Total mark: 10**
  - **06 marks from two term examinations.**
    Average marks obtained in two term examinations
    - 75% and above-6
    - 70%-74%-5
    - 65% to 69%- 4.5
    - 60 to 64%- 4.

  - **For class attendance 02 marks (Lecture and tutorial separately)**
    Marks shall be calculated as follows:
    - ≥ 90% : 2 marks
    - 81-90% :1.5 marks
    - 75- 80% : 1 mark
    - <75% : No mark

- **Card completion (marks 2)**
  - Two cards completed timely: **2**
  - If cards completed but not timely : 1

So, lowest marks of formative assessment for eligible student of Third professional MBBS examination in Pathology:

Lowest marks in two Term exam = 04
Lowest marks in class attendance = 1
Lowest mark in card completion =1

So, lowest marks of formative assessment = 06

Without scoring this 06 marks, students are not eligible for 3rd professional MBBS examination in Pathology.

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=6
- For 80% attendance=1
- For completion of item examinations timely-2

  i.e. 9 out of 10.

- A student will not be allowed to appear in more than two item examinations per week. If any student remain absent on that day for illness or accident or any valid reason, he or she may be allowed to give remaining 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

1.7. Summative Examination(3rd Professional MBBS examination on Pathology)

Summative examination will comprise of written (SAQ and MCQ), Structured Oral Examination (SOE) and practical (OSPE and traditional practical)

- **Written 100= SAQ 70 + MCQ 20 +Formative 10**
  a) 10 marks of formative assessment of each subject will be added to the written marks of 3rd Professional MBBS examination (section-1.7).
  b) For MCQ 20 marks are allocated. OMR sheet should be provided for MCQ part of examination. Total number of MCQ will be 20. There will be 10 MCQ from Pathology card- I and another 10 MCQ from card Pathology card- II . 10 marks will be allocated for each card.
     - Time allocation – 30 minutes
     - Type – Multiple true/ false. MCQs stem should not include all of the above, none of the above, which of the following etc
     - Each MCQ will carry 1 mark and each alternative will carry 0.2 marks
     - No negative marking
     - T:F should be 3:2 or 2:3

c) For SAQ , 70 marks are allocated:
   - There will be four groups (A, B, C and D). Instructions will be given to answer the questions in four different scripts each of which will be examined separately by four examiners.
   - Time allocation: 2 hour and 30 minutes.
   - Written question should include 60% from recall and 30% from understanding and 10% on problem based.

- **SOE :** Total marks for Structured Oral Examination is 100 and pass marks for SOE is 60%.

- **Practical examination will include OSPE and Traditional Practical examination. OSPE will be used for assessing skill competencies.**
  - The marks distribution in practical will be traditional 40 +10 (Practical note book marks 6 in two copies 2x3; 8 (eight) case history marks 4) and OSPE 50.
  - Pass mark in examinations is 60% of total marks. Student shall have to pass in three compartments, that is written (MCQ + SAQ + formative), oral and practical examination *separately*.
  - Honors Marks: Eighty five percent (85%) marks in all the components i,e. Written, SOE and Practical will be considered as Honors Marks.

1.8. Pre-requisite for appearing in term examination

Students shall complete all the items present in the card of that term before appearing in the term completion examination.

1.9. Pre-requisite for appearing in Third Professional MBBS Examination

i) Must have passed 2nd Professional MBBS Examination
ii) Students must complete all the items in the two cards and pass all the term examinations (Term-I and Term-II).
ii) Certificate from the respective head of the departments regarding students obtaining at least 75% attendance in all classes separately (lecture, practical, tutorial etc.) during the phase.

1.10. Examinations & distribution of marks of Third Professional Examination:

Subjects	**Written Exam marks (SAQ + MCQ + Formative)**	**Structured Oral Exam marks**	**Practical Exam marks**			**Total Marks**
			Traditional	**OSPE**	**Practical Khata and Case Reports**	
Pathology	70+20+10	100	40	50	10 (6+4)	300
Microbiology						
Pharmacology						

2.1 Departmental Objectives of Pathology

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

- Explain basic mechanism of diseases: Etiology, 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
  - Semen analysis
  - Routine examination of Urine
  - Microscopic examination of body fluids
  - CSF examination
  - Writing a requisition form for histo-pathological and cytological examination

2.2 List of Competencies to acquire:

1. Writing a histo-pathological 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 immunoflorescence study
8. Writing a requisition form for immunohistochemistry or immunoflorescence 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

2.3 Teaching hours in Pathology

i. Total teaching hours in General Pathology

Lecture: 35 hours

Tutorial: 18 X 2 = 36 hours

Practical: 05 x 1 = 05 hours

Total minimum teaching hours of General Pathology = 76 hours

ii. Total teaching hours in systemic pathology

Lecture 65x1 = 65 hours

Tutorial 37 x2 = 74 hours

Practical 13 x1= 13 hours

Total minimum teaching hours in Systemic Pathology = 152 hours

iii) In term I (16 wks)

Lecture: 49 hours (Pathology-I which include General Pathology, hematopathology, lymphoreticular system and other contents of systemic pathology)

Tutorial + Practical : 68 hours (Pathology-I which include General Pathology, hematopathology, lymphoreticular system and other contents of Systemic Pathology)

Total teaching hours in Term-I = 117 hours

iv) In term II (16 wks)

Lecture: 51 hours (Pathology-II which include respiratory system, CVS and other systems of systemic pathology)

Tutorial + practical:60 hours (Pathology-II which include rest of Systemic Pathology)

Total teaching hours in Term-II = 111 hours

Combined Teaching hours-Term -I and Term-II is 117+111=228 hours

v. Please follow the course contents in curriculum

2.4 Distribution of contents of Pathology course in the Two Terms

Term-I		Term-II	
Content	**Duration**	**Content**	**Duration**
General Pathology, Systemic Pathology(I) 1. Haematolymphoid 2.Lymphoreticular	16 weeks Lecture: 4 (four) per week Tutorial + Practical = 02 per week (tutorial and practical classes will run simultaneously) Extra lecture classes may be converted into tutorial and practical classes.	Rest of Systemic Pathology(II)	16 weeks Lecture: 4 (four) per week Tutorial + Practical = 02 per week (tutorial and practical classes will run simultaneously) Extra lecture classes may be converted into tutorial and practical classes.

2.6 Class Performance Record Card (Pathology-I):

SL No	Name of Item	Full Marks (10)	Pass marks-(6)	Signature Remarks
A. General Pathology				
1	Introduction to Pathology, Preservation and transportation of specimen and Tissue processing. Histopathology and Cytopathology laboratory visit. Preparation of histopathology and cytopathology fixative- 10% neutral buffered formalin and 95% ethyl alcohol.			
2	Cell injury-Reversible cell injury and irreversible cell injury, Cellular swelling and fatty change, Growth disturbance and adaptive changes (atrophy, hypertrophy, hyperplasia and metaplasia), autophagy, Growth factors, Stem cells and cellular ageing.			
3	Irreversible cell injury-necrosis, necroptosis and pyroptosis, apoptosis, Pigment and Calcification			
4	Acute inflammation (1)-Definition, advantage and disadvantage of inflammation, cardinal signs, Vascular and cellular changes in inflammation, mechanisms of increased vascular permeability.			
5	Acute inflammation (2)-Chemical mediators of inflammation (arachidonic acid metabolites, cytokines, chemokines, complements), phagocytosis			

6	Chronic inflammation-definition and causes. Granulomatous inflammation with examples, classification of granuloma, mechanisms of immune granuloma			
7	Repair and Healing-definition, types of healing, steps of bone healing, factors influencing wound healing, complications of healing.			
8	Edema and electrolyte disorder-definition, classification (pathophysiological), mechanisms of edema in heart failure, cirrhosis of liver, nephrotic syndrome and malnutrition, hyper and hypokalamia, hypernatremia, hyponatremia			
9	Hyperemia, congestion, hemorrhage and shock-Definition, classification, examples, types of shock, pathogenesis of septic shock, stages of shock			
10	Thromboembolism and Infarction-definition, antemortem and post mortem clot, factors influencing infarction, pathogenesis of thrombosis, embolus-types. decompression sickness, pulmonary embolism			
11	Neoplasia (1)-definition, classification of tumor, invasion and metastasis, familial cancers, occupational cancers, tumor kinetics, Hallmarks of cancer,			
12	Neoplasia (2) P53, Knudson's two hit theory, epigenetic changes.			
13	Neoplasia (3) Carcinogenesis-Types of carcinogen, chemical carcinogen, Initiator and promoter of tumor, radiation induced tumors, viral and bacterial oncogenes			
14	Neoplasia (4)Tumor immunity, clinical aspect of neoplasia-cancer cachexia, paraneoplastic syndrome, Tumor markers and laboratory diagnosis of tumor			
15	Outline of genetics-mutation and types of mutation, FISH. Name and characteristics of autosomal dominant and recessive disorders, Sex linked recessive disorders, Chromosomal disorders-Down syndrome, Klinefelter syndrome, Turner syndrome, Karyotyping,			
16	Immunopathology-Tolerance, Causes and examples of autoimmune diseases, hypersensitivity types with examples-Anaphylactic reaction, Tuberculin test			
17	Infectious disease-Tuberculosis, Leprosy, Syphilis, AIDS			
18	Nutritional disorders- Definition of PEM, marasmus, kwashiorkor, vitamin deficiency, trace elements deficiency, obesity			
19.	Environmental diseases-Air pollution, health effects of outdoor and indoor air pollution, lead poisoning, Arsenic effects, Health effects of tobacco, Health effects of alcohol, Adverse drug reactions, drug abuse, thermal injury, Ionizing radiation			

20.	Diseases of infancy and childhood-Congenital anomalies-causes, tumor and tumor like conditions of infancy and childhood.			
B. Systemic Pathology (I)				
21	Lymphoreticular system- Causes of Lymphadenopathy, Classify lymphoma, Differentiate Hodgkin and Non-Hodgkin lymphoma, Staging, Diagnosis and prognosis of Hodgkin and NHL. Causes of spleenomegaly.			
22	Hematolymphoid- Hematopoiesis, Causes of leukocytosis, eosinophilia, lymphocytosis, iron metabolism, RBC indices, PBF, DC, TC and bone marrow examination.			
23	Hematolymphoid ii) RBC Anaemia, classification, iron deficiency, folic acid and Vitamin B12, deficiency anaemia, Pernicious anaemia-Cause, pathogenesis, clinical features, and Diagnosis.Myeloproliferative disorders-polycythaemia(Definition, types, clinical features and diagnosis)			
24	Hematolymphoid iii) Haemolytic anaemia- Classification and diagnosis, Direct and indirect Coomb's test. Reticulocyte count.			
25	Hematolymphoid iv) Thalassemia and aplastic anaemia-aetiology, pathogenesis, clinical features and diagnosis			
26	Hematolymphoid v. Haemorrhagic disorder-bleeding disorder and coagulation disorders, cause, pathogenesis, clinical features and diagnosis of ITP, hemophilia and DIC.			
27	Hematolymphoid. vi Leukemia-definition, etiology, classification, clinical features and diagnosis			
28	Hematolymphoid vii. –Practical Hb estimation, ESR			
29	Hematolymphoid viii –Practical DC, TC, and PBF. Bleeding time and clotting time			
30	Blood grouping & cross matching. Indications, screening and complications of blood transfusion.			
31	Acid base balance-metabolic acidosis, metabolic alkalosis, respiratory acidosis and alkalosis, CHO metabolic disorders, including hypo and hyperglycemia, lipid metabolic disorder, Lipid profile, causes of hypercholesterolemia, Arterial blood gas analysis			
32	Causes of pleural, peritoneal, pericardial effusion. Examination of body fluids-CSF, Pleural fluid, Peritoneal fluid, pericardial fluid, Joint fluid etc. Examination of body fluids for malignant cells.			

Class Performance record Card II(Pathology-II)

SL No	Name of Item	Full Marks (10)	Pass marks (6)	Signature Remarks
Systemic Pathology (II)				
1	Respiratory system– Congenital anomalies, Pneumonia and lung abscess, Pulmonary tuberculosis-aetiology,pathogenesis,morphology, clinical features, diagnosis and complications.			
2	Respiratory system – Chronic Obstructive air way disease,Bronchialasthma aetiology,pathogenesis,morphology,clinical features, diagnosis and complications.			
3	Respiratory system–lung tumor, Pneumoconiosis, Pulmonaryedema aetiology, pathogenesis, morphology, clinical features, diagnosis and prognosis.			
4	Urinary system (i) congenital disease, clinical presentation of renal disease, renal function tests, Causes of azotemia and uraemia, creatinine clearance test.			
5	Urinary system (i) Glomerular diseases-Acute post streptococcal glomerulonephritis-Etiopathogenesis and clinical features, diagnosis and complications. Nephrotic syndrome-cause, pathophysiology, clinical features and diagnosis. Chronic glomerulonephritis			
6	Urinary system (ii)Tubular disease-Acute tubular injury/necrosis, causes of tubulointerstitial nephritis. Pyelonephritis-acute and chronic-etiopathogenesis and diagnosis. acute renal failure-cause and clinical course.			
7	Urinary system ((iii) Renal tumors-Renal cell carcinoma-diagnosis, Name the urinary bladder tumors-Diagnosis, Renal stone-types and complications.			
8	Urinary system –Examination of urine-Physical, chemical, and microscopic. Causes and diagnosis of pyuria,ketonuria,haematuria, proteinuria.			
9	Diseases of urinary bladder-cystitis and name the bladder tumors. Diagnosis of cystitis and bladder tumors.			
10	GIT – Oral cavity-causes of oral ulcer and leukoplakia, Tumors of oral cavity, Name the tumors of salivary gland and esophagus. Diagnosis of oral cavity, esophageal and salivary gland tumors.			

11	GIT – Acute and chronic gastritis, Peptic ulcer and gastric carcinoma. Diagnosis of benign and malignant ulcer. Occult blood test.			
12	GIT – small intestine-polyp and tumors, Inflammatory bowel disease, causes of malabsorption and ulcer. Acute appendicitis-causes, morphology, clinical features, diagnosis and complications. Differences between a tubercular ulcer and a typhoid ulcer			
13	GIT – large gut-ulcerative colitis, amoebic ulcer, Carcinoma of colon-etiopathogenesis, morphology and diagnosis. Carcinoma of rectum, hemorrhoids-types, diagnosis and complication			
14	Hepatobiliary – Jaundice-definition, types, diagnosis and complications. Acute and chronic hepatitis-cause, morphology, diagnosis and complications, Liver abscess-cause and diagnosis and complications, liver function tests.			
15	Hepato-biliary—Cirrhosis of liver-Aetiopathogenesis, morphology, clinical features, diagnosis and complications, portal hypertension, hepatic failure			
16	Hepato-biliary— aetiopathogenesis,clinical features, morphology , diagnosis of tumors of liver			
17	Gall bladder-cholecystitis and cholelithiasis-types,pathogenesis, clinical features and complications, tumors of gall bladder.			
18	MGS— Causes and complications of undescended testis, Inflammation and Tumors of testis(seminoma), Prostate-Inflammation, hyperplasia and tumors-etiopathogenesis,morphology, clinical features, diagnosis and complications, Causes of sterility and semen analysis			
19	FGS – cervix-causes of cervicitis and sulpingitis,precancerous lesions, cervical cancer- types, risk factors,screening,clinical features, morphology, and diagnosis. Endometriosis, Leiomyoma of uterus, endometrial hyperplasia and its risk, Ovary-chocolate cyst-complications, name of tumors and tumor markers, Morphology of teratoma.			
20	FGS – placental trophoblastic tumors-classification and diagnosis, Pregnancy test			

21	Breast—Causes of breast lump, Name the inflammatory and fibrocystic diseases of breast, diagnosis of breast lump			
22	Breast—Classification of breast tumors, Risk factors and prognostic factors of breast carcinoma, benign(fibroadenoma) and malignant tumor(Duct cell carcinoma)-morphology and diagnosis			
23	Endocrine – thyroid-Causes of thyroiditis, Hashimoto thyroiditis immuopathology, morphology, diagnosis. Goiter-causes, pathogenesis, morphology, diagnosis and complications.Thyroid tumors-Classification, morphology of papillary carcinoma of thyroid.			
24	Endocrine – Diabetes mellitus Definition,classification,pathogenesis,diagnosis and complications			
25	Endocrine – OGTT-Indications, Precautions, Procedure, and interpretation. What is IGT and GDM, Ketoacidosis-mechanism of development,Ketone body formation and diagnosis, of ketonuria, and HbA1C.Causes of glycosuria, types of glycosuria, causes and complications.			
26	Name the skin inflammations, Premalignant lesions, Tumors and Bullous lesions. How will you diagnose inflammations, premalignant lesions, tumors and bullous lesions of skin.			
27	CNS-Meningitis, encephalitis, Subarachnoid hemorrhage-cause, diagnosis and complications, Stroke-types and complications, brain edema , Brain abscess, Name the Tumors of CNS, eye and nasal cavity.			
28	Bones, soft tissue, joint, peripheral nerve and skeletal muscles disorders—classify tumor of soft tissue and bone, osteomyelitis-types, morphology, diagnosis and complications.Rheumatoid arthritis, osteoarthritis, osteoporosis-pathogenesis and complications. Name of Benign and malignant peripheral nerve sheath tumors, Mysthania Gravis			
29	An outline of autopsy-Observation of gross examination of autopsy specimen, slide preparation and staining of autopsy specimen-Histopathology laboratory visit			

30	Heart and Blood vessels – Types of vasculitis, tumors of blood vessels and atherosclerosis-Risk factors, pathogenesis, morphology, and complications.			
31	Ischemic heart disease(IHD)-types and complications, morphological examination after MI and hypertensive heart disease-types,cause,morphology,complication Diagnosis of myocardial infarction-Cardiac enzymes			
32	Infective endocarditis,Myocarditis and pericarditis-cause, clinical features, diagnosis and complications. Rheumaticfever-Pathogenesis,morphology, Diagnosis, complications. Name of congenital heart diseases.			

2.6 : Summative Examination (3rd professional MBBS examination)

A. Written - MCQ+SAQ+formative examination
B. Viva - Structured Oral Examination(SOE)
C. Practical- OSPE and Traditional examination

A.Written

I. MCQ

For MCQ 20 marks are allocated.

- OMR sheet should be provided for MCQ part of examination.
- Total number of MCQ will be 20.
- There will be 10 MCQ from card I and another 10 MCQ from card II .
- 10 marks will be allocated for each group
- Time allocation – 30 minutes
- Type – Multiple true/ false. MCQs stem should not include all of the above, none of the above, which of the following etc
- Each MCQ will carry 1 mark and each alternative will carry 0.2 marks
- No negative marking
- T:F should be 3:2 or 2:3

Examples of MCQ

Q. No. 1. Reversible cell injury include

T-a) Cellular swelling
T-b) fatty change
T-c) Dilation of the endoplasmic reticulum
F-d) Necrosis
F-e) Apoptosis

Q. No. 2. Cardiogenic shock arise from

F-a) Overwhelming microbial infections
T-b) Cardiac tamponade
T-c) Pulmonary embolism
F-d) Trauma
T-e) Myocardial infarction.

Q.No. 3. Oncofetal antigen(s)

T-a) CEA.
T-b) Alpha-fetoprotein.
F-c) calcitonin .
F-d) Human chorionic gonadotropin.
F-e) Neuron specific enolase.

Q.No. 4. Autosomal recessive disorder(s) include

F-a) Acute intermittent porphyria.
T-b) Cystic fibrosis.
T-c) Wilson disease.
F-d) Familial hypercholesterolemia.
T-e) Glycogen storage disease.

II. SAQ-70 marks are allocated: (Four groups A,B,C & D, each group 17.5 marks)

There will be four groups of questions (Groups A, B, C and D). Instructions will be given to the students to use separate answer scripts for each group which will be examined separately by four examiners.

- Time allocation: 2 hour and 30 minutes.
- Written questions should include 60% from recall and 30% from understanding and 10% on problem based.
- **Written question will have the following instructions.**
  a. Answer four out of five questions (marks-5) from each group, including number five which is compulsory (problem basesd-2.5 marks each).
  b. Use separate answer script for each group.
- ***Outline of written question paper***
  Group A and B will cover Pathology card I content and Group C and D will cover Pathology Card II content.

Sample SAQs

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

Q.2. How edema due to lymphatic obstruction occur? List three possible causes of edema due to lymphatic obstruction (2+3)

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

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

Q.5. What are the differences between dysplasia and carcinoma in situ? How premalignant conditions of cervix can be diagnosed early?(3+2)

Q.6. What is wound healing? List four local causes of delayed wound healing. Why wound healing is delayed in vitamin C deficiency?(1+2+2)

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

Q.8. What is wound contraction? Write four differences between healing by primary intention and secondary intention?(1+4)

Q.9. What are the differences between exudate and transudate? How blood vessel become more permeable in acute inflammation?(2.5+2.5)

Q.10. What is granuloma? Briefly mention the pathogenesis of immune granuloma.Why there is ceseation in tubercular granuloma?(1+3+1)

Problem based questions

Q11. 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. Ultrasonogram reveals a solid lesion. What is your probable diagnosis? How will you proceed to diagnose such a patient?(1+1.5)

Q.12. 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).

Q13. 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.14. A 40 years man presented with severe anaemia. His hemoglobin was 5gm/dl,ESR-100 mm in 1st hour, PCV was reduced, TC of WBC was 1500/cumm of blood, peripheral blood film showed pancytopenia. What could be the possible diagnosis? How will you confirm it?(1+1.5)

SAQ:Group A (17.5 marks)

1. cell injury/ cellular adaptation/ inflammation /Intracellular accumulation and calcification(5)
2. neoplasia /carcinogen/child hood tumors/healing and repair(5).
3. neoplasia/ thromboembolism/ oedema/shock/hyperemia & congestion and infarction (5)
4. genetics/Infectious disease/ Nutritional & Environmental Pathology(5)
5. Problem based question (cell inury/Inflammation/ adaptation / fluid and hemodynamics/neoplasia/Infectious disease) (2.5)

SAQ: Group B(17.5 marks)

1. Biopsy, FNAC, Frozen section, Tissue staining and tumor diagnosis. (5)
2. Hematopathology-RBC disorders-All anaemias and polycythaemia(5)
3. Hematopathology-WBC disorders including multiple myeloma and Leukemia (5)
4. Hematopathology-Haemorrhagic disorder-ITP, Hemophilia, Blood grouping and cross matching, Complications of blood Transfusion, screening tests before blood transfusion (5)
5. Problem based (Hematology). (2.5 marks)

SAQ: Group C (17.5 marks)

1. Systemic pathology(5)
2. Systemic pathology/ laboratory investigations/ (2.5+2.5)
3. Systemic Pathology / laboratory investigations (2.5+2.5)
4. Laboratory investigations (5)
5. Problem based (LFT or KFT, Semen analysis, CSF, Urine examination) (2.5marks)

SAQ: Group D (17.5marks)

1. Systemic pathology(5)
2. Systemic pathology/ laboratory investigations(2.5+2.5)
3. Systemic pathology / laboratory investigations(2.5+2.5)
4. Systemic pathology (5)
5. Problem based (Systemic pathology) (2.5marks)

**** In group C and D other than the problem based the total questions from topic no 2 and 3 will contain laboratory investigations at least 50 % by weight.

Sample Question: SAQ

Third Professional MBBS Examination of May, 222

Subject: Pathology (New curriculum 2012)

Short Answer Questions (SAQ)

Full Marks: 70 **Time : 2 hour 30 min.**

Instruction: Answer any four out of five questions from each group of which number five is compulsory.

Use separate answer script for each group

Group A (17.5 marks)

1. Define necrosis? Write three differences between necrosis and apoptosis. Why inflammation does not occur in apoptosis but occur in necrosis? (1+3+1)
2. What is skip metastasis ? Differentiate benign tumor from malignant tumor with examples? Why lymphedema of arm occur after axillary dissection in patient with carcinoma of breast ?(1+2+2)
3. What is pulmonary embolism? Why there is "bends" and chokes in patients with decompression sickness? Why DIC occur in amniotic fluid embolism? (1+2+2))
4. What are the characterstics of autosomal dominant disorders? Write down the clinical features of Down syndrome.(2.5+2.5).
5. A male of 70 year man has been suffering from dry cough, weight loss, anorexia and haemoptysis for the last four months. On examination few matted left sided cervical lymph nodes were identified. Chest X-ray shows irregular opacity with cavitation in his right apical region . What is your probable diagnosis? How can you confirm the diagnosis (1.5 +1)

Group B(17.5 marks)

1. What is tumor grading and staging? Which one is more important and why ? Give an outline of laboratory diagnosis of tumor.(1+1+3)
2. Why there is pancytopenia in megaloblastic anaemia? How will you proceed to diagnose a case of megaloblastic anemia in the laboratory? (2+3)
3. What is leukemoid reaction? Differentiate leukemoid reaction from leukemia. (1+4)
4. A boy of 14 years has presented with haemarthrosis of left ankle joint. His maternal ankle has got similar type of problem. How will you proceed to diagnose such a case in the laboratory? (5)

5. A 65 year old male has presented with anemia, bone pain, and vertebral fracture. X- ray shows osteolytic punched out lesions in skull bone and vertebra. What is your probable diagnosis? How will you confirm it? (1.5 + 1)

Group C(17.5 marks)

1. What is peptic ulcer? Write down four differences between a peptic ulcer and a malignant ulcer. (1 +4)

2. A male of 45 years complained of left sided chest pain which relieved on taking rest and spraying nitroglycerin under his tongue. What is your probable diagnosis ? How will you diagnose a case of myocardial infarction in the laboratory. (2.5+2.5)

3. What is nephrotic syndrome? What are the causes of nephrotic syndrome ? Why serum creatinine is more reliable renal function test compared to blood urea? (1+1.5+2.5)

4. What is meningitis? Write down the laboratory investigations done to diagnose bacterial, tubercular and viral meningitis. (1+4)

5. A boy of seven years presented with puffiness of face and scanty micturation for last three days. His mother states that he also suffered from a single attack of convulsion two days back. He gives a H/O infected scabies 1 month back? What is your probable diagnosis? What findings do you expect in his urine examination? (1.5 +1)

Group D(17.5)

1. What is COPD? How will you differentiate obstructive airway disease from restrictive airway diseases? Why pneumothorax occur in patients with emphysema?(1+3+1)

2. Define hepatitis and its types with examples? Tabulate the differences in laboratory investigations among three types of jaundice. (2.5+2.5)

3. Name the tumors of breast. Why the endometriotic cyst in ovary is called Chocolate cyst? Write down the indications of pregnancy test.(1.5+1+2.5)

4. Name the tumors of skin? Why basal cell carcinoma is called a rodent ulcer? Which type of growth pattern is clinically significant in case of malignant melanoma?(2+2+1)

5. A lady of 36 gives history of increased menstrual blood loss for the last three months. USG of lower abdomen shows a submucosal mass in her uterine cavity. The mass was removed. Cut section of mass revealed whorled appearance. What is your probable diagnosis? How can you confirm it? (1.5 +1)

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 student will get the average mark of the two examiners of that board. Total marks difference of two examiners should not be more than 10% in a board. The board content should be changed on every two days. The total marks will be combined marks of two boards. Pass marks is 60% combinedly (Board-I and Board-II).

Contents of Board I and **Board II**

Board I will assess Pathology Card I *which includes all chapters of General Pathology, fluid and electrolyte imbalance covering acid base balance, electrolyte disorders, CHO metabolic disorders, including hypo and hyperglycemia, lipid metabolic disorder, , lymphoreticular system and hematopathology, examination of body fluid, obesity.*

Board II will assess Pathology Card II, *which includes the systemic pathology (excluding Haematolymphoid). Different items of clinical pathology will be incorporated in the relevant chapter of systemic pathology, such as urine examination and KFT can be included in renal system, semen analysis in male genital system, LFT in HBS, CSF examination in CNS.*

SOE – Box Distribution
Board – 1 (Pathology card- I) (There must be minimum 20 cards in each box, each card-5 marks)

GP1	GP2	GP3	GP4	GP5
Cell injury Cellular adaptation Necrosis & Apoptosis Intracellular accumulation and calcification	Inflammation Healing and regeneration Immunopathology Infectious diseases	Neoplasia Childhood tumor	Edema, Electrolyte disorders Thrombosis &Embolism Hyperemia and congestion Examination of body fluids, Acid- base disorders	Environmental& Nutritional Pathology, Shock, Haemorrhage, Infarction, Outline of Genetics
SP1	**SP2**	**SP3**	**SP4**	**GP6**
Haematology Hemopoiesis, RBC Disorders including anaemias and myeloproliferative disorders	Hematology WBC disorders including Leukemia Multiple myeloma Causes of lymphadenopathy, Hodgkin lymphoma and NHL, Causes of splenomegaly	Hematology Haemorrhagic disorders Blood Grouping & cross matching Transfusion reactions	Practical Hematology Plasma and serum, Anticoagulants Haemoglobin estimation, ESR, Bone marrow examination, PBF, HCT, BT, CT,PT, PTT, TC, DC, reticulocyte count, Coomb's test	Problem Based question on items of General Pathology

Board- 2 (Pathology Card- II) (There must be minimum 20 cards in each box, each card-5 marks)

SP5	SP6	SP7	SP8	SP9
Atherosclerosis Tumors of blood vessels Ischaemic Heart disease(IHD) Endocarditis,myocarditis, Pericarditis and Rheumatic fever-Pathogenesis, morphology complications **Lipid Profile Cardiac enzymes**	GIT-Inflammation, ulcer and tumors of oral cavity, esophagus, Stomach,intestine, colon and salivary gland Endoscopic biopsy, Colonoscopy, FNAC of Salivary glands	Hepatobiliary System-Viral hepatitis, cirrhosis of liver, Hepatocellular carcinoma **Jaundice and Liver function Tests**	Urinary system-Acute post streptococcal glomerulonephritis, Nephrotic syndrome, pyelonephritis,Tumors of kidney and bladder, Causes of uraemia, proteinuria, hematuria and ketonuria **Renal function tests** **Urine examination**	Endocrine system- Hypo or hyper thyroidism Hashimoto Thyroiditis, Tumors of thyroid gland **Diabetes mellitus & complications**
SP10	**SP11**	**SP12**	**SP13**	**SP14**
Male genital system Testicular tumors Nodular hyperplasia and tumors of Prostate **Semen analysis** Female Genital System-Tumors of uterus and ovary, endometriosis Breast-Inflammation and tumors, Risk factors and prognostic factors **Pregnancy test**	Respiratory system-Pneumonia, COPD, Bronchogenic carcinoma Pulmonary Tuberculosis **Pleural fluid examination**	CNS, Eye, ENT, Skin Musculoskeletal system, Bones, joints and soft tissue tumors. **Examination of CSF**	Techniques in histopathology including use of different stains, fixatives IHC Frozen section FNAC Pap smear	Problem Based question on items of Systemic Pathology of Pathology card -II

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												
13												

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 noncaseating? 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

   (The student may be asked whether granuloma of sarcoidosis is caseating or noncaseating? & can tell the mechanism of immune granuloma)

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 Langhan'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

12. If the student give wrong answer-score-0

C. Practical examination: (Total marks- 100: pass marks-60%)

Total marks- 100

OSPE-50 (Pathology card-I &II)

Pathology card-I=25

Slides- 2 (2x5=10)

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

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

Pathology card-II=25

Slides- 2 (2x5=10)

Museum specimens- 2 (2x5=10)

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

Traditional- 40+10 marks

Traditional practicals-40 marks

(Practical note books- 2x3= 6 ; Case history 8x 0.5 =4) = 10

- **OSPE- Objective Structured Practical Examination**
  - Number of station- 10 (5 stations should be selected from Pathology-I content and 5 stations from Pathology-II content)
  - Allocation for time for each station- 2 minutes (2x10= 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 and Pathology card-II contents.

- If the procedure needs more than two minutes then there may be a gap station in the next.
- 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.
- All 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 vise 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

Q.2. Sample- Gall bladder with stones (total marks- 5)

a. Question- Identify the specimen and give your probable diagnosis (marks- 1+1)

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)

Question station

Q-3. Jar containing museum specimen with reagent (total marks- 5)

a. Question: Identify the reagent kept in the jar (mark-1).

b. Question: What are the actions on the specimen supplied (mark- 1)

c. Question: Name two other reagents used for the same purpose (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 Westergren 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 of ESR tube in stand)- Yes----No

Procedure station

Q.5. Haemoglobinometer tube-containing blood mixed with N/10 HCl has been provided and placed in a Sahli's haemoglobinometer matching box. Estimate haemoglobin by this method. Question: What is the normal value in an adult female- (marks- 5).

Checklist for the examiner (please circle):

a. Distilled water added drop by drop- Yes----No

b. Whether the candidate is matching or not- Yes----No

c. Value mentioned in gram & percentage- Yes----No

d. Estimation is correct Yes----No

Question station

Q.6. Bone marrow needle has been given (5)

a. Identify the instrument (mark- 1)

b. Write down its use (mark- 1)

c. Write the sites from where bone marrow can be aspirated in case of adults and children (marks- 3).

- **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 Westergren method may be given (marks- 8x1=8)
  - Stained PBF for comment-1 (marks- 5x1=5)
  - Histopathology slides- 2 (marks- 8x2=16)
  - Data interpretation-1 (marks-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 Note Books and Case History- Total marks-10

Practical note book-(2x3)=6 + Case history-4(eight case histories)

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. He/she should submit it to the convener for marks during 3rd Professional MBBS Examination (practical examination) in Pathology.

Preparation of mark sheets (2nd 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 sheet 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- I-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.

4. 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 21 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
- Practical marks- three sealed envelopes from convener signed by four 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.**	 **50** **40** **10**	**100 (Pass marks – 60)**	
4. Oral examination (Structured oral examination) • **2 board** • **4 examiner** • **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 center)/ examiner to send the properly marked and sealed mark sheets to the Deputy Controller of examinations and Two tabulators 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
Center 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.

Suggestions:

- A supervisory committee should be formed to observe the proper conduction of examinations in different centers.
- There should not be the much variation in marking (ideally the difference should not exceed 10%).
- For OSPE there should be check list in the procedure station with breakup of marks.
- In course of time there should be a central bank or central questions for OSPE.
- In course of time there should be a central bank or central questions for SOE.