

# PATHOLOGY CURRICULUM

## AIIMS RISHIKESH

### I Goal

To provide complete knowledge of the disease entity, its cause, mechanism and outcome in order to understand the biology of disease. The concept and information provided should enable the students to understand the disease process, organ changes and clinical manifestations.

### II. Learning Objectives

A MBBS student, at the end of the training in Pathology, will be able to:

1. Understand the concepts of cell injury and changes produced thereby in different tissue and organs and the capacity of the human body for healing.
2. Understand the normal homeostatic mechanisms, the derangements of these mechanisms and the effects on the human system.
3. Understand the etiopathogenesis, the pathological effects and the clinico-pathological correlation of common infectious diseases and non-infectious diseases like degenerative, metabolic, and immunologic conditions.
4. Understand the concepts of neoplasia with reference to the etiology, gross and microscopic features, diagnosis and prognosis in different tissues and organs of the body.
5. Correlate normal and altered morphology (macro and microscopic) of different organs in different diseases to the extent needed for understanding the disease process and their clinical significance.
6. Understand the common hematological disorders and the investigations necessary to diagnose them and determine their prognosis.
7. Describe the rationale and principles of technical procedures of diagnostic pathological laboratory tests.
8. Perform and interpret in a proper manner certain simple clinico-pathological procedures on blood, urine and other biological fluid samples.
9. Know the principles of collection, handling, storage and dispatch of clinical samples from patients in a proper manner

### III Course Content

#### III A. General pathology

---

##### 1. Cell injury

###### *Must know:*

1. Causes
2. Mechanism: ischemic, toxic, free radical induced
3. Reversible cell injury:
  - a) Types
  - b) Morphology: swelling, vacuolation, hyaline, fatty change
4. Irreversible cell injury
  - a) Cellular changes
  - b) Necrosis
    - Types
    - Morphological features of each type with examples
  - c) Gangrene:
    - Classification
    - Features of each type

5. Apoptosis:
  - a) Mechanism
  - b) Clinical significance
  - c) Difference from necrosis
6. Calcification: dystrophic and metastatic
7. Disorders of pigments: Endogenous and exogenous

***May know:***

8. Ageing

**2. Inflammation and repair**

***Must know:***

1. Acute inflammation:
  - a) Features
  - b) Causes
  - c) Vascular and cellular events
  - d) Morphologic variants of acute inflammation
  - e) Inflammatory cells and mediators
  - f) Outcome
2. Chronic inflammation:
  - a) Causes
  - b) Types: nonspecific and granulomatous with examples
  - c) Importance of macrophage
  - d) Outcome
3. Wound healing
  - a) Primary and secondary union
  - b) Factors promoting and delaying the process
  - c) Angiogenesis and angiogenetic factors
  - d) Fracture healing

**3. Circulatory disturbances**

***Must know:***

1. Edema
  - a) Types
  - b) Pathophysiology
2. Chronic venous congestion: pathogenesis and morphological changes in
  - a) Lung
  - b) Liver
  - c) Spleen
3. Thrombosis:
  - a) Causes
  - b) Mechanism of thrombus formation
  - c) Natural history
  - d) Effects
4. Embolism:

- a) Classification
  - b) Process of its formation
  - c) Effects
5. Infarction:
- a) Types with examples
  - b) Common sites
  - c) Factors influencing the formation of an infarct
6. Shock:
- a) Types
  - b) Pathogenesis and Morphological changes

#### 4. Neoplasia

##### *Must know:*

1. Hamartoma, Cribriform, dysplasia, carcinoma in situ
2. Neoplasia: classification, histogenesis, biologic behaviour: benign and malignant; carcinoma and sarcoma
3. Malignancy: Molecular basis of cancer, grades and stages, local and distant spread
4. Carcinogenesis: Environmental carcinogens, chemical, viral, occupational and heredity
5. Oncogenes and tumour suppressor genes
6. Tumour and host interactions: Systemic effects including paraneoplastic syndromes
7. Laboratory diagnosis: Cytology, biopsy, tumour markers

#### 5. Immunopathology

##### *Must know:*

1. Immune system: Organisation, cells, antibodies and regulation of immune responses.
2. Hypersensitivity: Types, antibody and cell mediated tissue injury with examples
3. Secondary immunodeficiency including HIV infection Pathology AIDS: aetiology, modes of transmission, diagnostic procedures and handling of infected material and health education.
4. Auto-immune disorders like systemic lupus erythematosus; organ specific and non-organ specific such as polyarteritis nodosa, Hashimoto's disease.
5. Amyloidosis: Classification, pathogenesis, morphology, laboratory diagnosis

##### *Should know:*

6. Primary immunodeficiency
7. Tumour immunity

##### *May Know:*

8. Organ transplantation: Immunologic basis of rejection and graft versus host reaction

## 6. Infectious diseases

### *Must know:*

1. Mycobacterial diseases: tuberculosis and leprosy
2. Bacterial diseases: Syphilis
3. Opportunistic infections
4. Parasitic diseases: malaria, filaria, amebiasis, hydatid

### *Should know:*

5. Viral: polio, herpes

### *May know:*

6. Bacterial diseases: Pyogenic, typhoid, diphtheria, gram negative infection, bacillary dysentery
7. Fungal diseases
8. Kala-azar, cysticercosis
9. Viral: rabies, measles; rickettsia, chlamydial infection

## 7. Genetic and environmental diseases

### *Must know:*

1. Autosomal and sex-linked disorders with examples
2. Protein energy malnutrition, vitamin and mineral deficiency disorders
3. Radiation injury
4. Occupational diseases

### *Should Know:*

5. Metabolic disorders

### *May know:*

6. Molecular diagnosis

## 8. Childhood diseases

### *Must know:*

1. Hydrops (Immune and Non-immune)
2. Cystic fibrosis
3. Neuroblastoma, hepatoblastoma and retinoblastoma

### *May know:*

4. Sudden infant death syndrome

## III B. Systemic pathology

### 9. Haematopathology

*Must know:*

1. Constituents of blood and bone marrow
2. Haematopoiesis
3. Classification of anaemia
4. Causes, pathophysiology, bone marrow and peripheral smear features, laboratory diagnosis and complications of
  - i. Iron deficiency anaemia
  - ii. Vit b<sub>12</sub> and folate deficiency
  - iii. Thalassaemia (inclusive of classification)
  - iv. Sickle cell anaemia
  - v. Hereditary spherocytosis
  - vi. G6PD deficiency
  - vii. PNH
  - viii. Autoimmune haemolytic anaemia
  - ix. Microangiopathic haemolytic anaemia
  - x. Haemolytic disease of the newborn
  - xi. Aplastic anaemia
5. Laboratory approach to diagnosis of anaemia: microcytic, normocytic, macrocytic; hemolytic anaemia
6. Leukaemia: classification and diagnosis
  - i. Acute
  - ii. Chronic
7. Leukaemoid reaction: meaning, causes, differentiation from leukaemia
8. Causes of leukopenia, thrombocytopenia and pancytopenia
9. Blood picture and diagnosis of chronic myeloproliferative disorders
10. Pathophysiology, blood picture and laboratory diagnosis of ITP and lab diagnosis of dengue
11. Aetiology, pathophysiology and diagnosis of
  - i. Haemophilia
  - ii. Von willebrand's disease
  - iii. DIC
12. Laboratory approach to coagulation disorders
13. Blood and bone marrow picture, laboratory diagnosis and clinical features of plasma cell dyscrasia
14. Leucoerythroblastic picture
15. Blood transfusion practice: grouping, cross matching, donor selection, component therapy, rational use of blood transfusion, adverse effects and complications.

***Should Know:***

16. Prognosis of leukemia

***May know:***

17. Blood picture, diagnosis and natural history of myelodysplastic syndromes

**10. Lymphoreticular Pathology**

***Must know:***

1. Lymphoma
  - a. Classification
  - b. Morphology and laboratory diagnosis of:
    - i. Hodgkin's lymphoma
    - ii. Small lymphocytic lymphoma
    - iii. Burkitt lymphoma
2. Causes of lymphadenitis
3. Morphological features of reactive hyperplasia and tuberculous lymphadenitis
4. Causes of splenomegaly
5. Hypersplenism

***May know:***

6. Non-Hodgkin's lymphoma
7. Follicular lymphoma

**11. Cardiovascular pathology**

***Must know:***

Aetiology, pathogenesis, gross and microscopic morphology, complications, laboratory diagnosis and basic clinical features of

1. Rheumatic fever and rheumatic heart disease
2. Infective endocarditis
3. Atherosclerosis
4. Myocardial infarction
5. Hypertension

***Should know:***

6. Classification of vasculitis, types of vessels where the common vasculitis are found, laboratory diagnosis.

***May know:***

7. Causes and laboratory investigation of pericarditis
8. Classification, causes, morphology and clinical features of cardiomyopathy
9. Classification and morphology of cardiac tumours

**12. Respiratory pathology**

***Must know:***

1. Structure of bronchial tree and alveoli, normal lung function tests
2. Concept of obstructive and restrictive lung diseases with special reference to lung function
3. Obstructive lung diseases
4. Classification, aetiology, pathogenesis, gross and microscopic morphology, complications and clinical features of:
  - a. Emphysema
  - b. Bronchiectasis
  - c. Bronchial asthma
5. Classification, aetiology, pathogenesis, gross and microscopic morphology, complications and clinical features of pneumonia
6. Aetiology, morphology and complications of lung abscess
7. Classification, risk factors, gross and microscopic morphology, complications and clinical features of lung tumors.
8. Risk factors, pathogenesis, morphology, complications of hyaline membrane disease

***Should Know:***

9. Chronic bronchitis: definition, morphological features
10. Pneumoconiosis, silicosis and asbestosis, anthracosis

***May know:***

11. Risk factors, classification, and morphology of laryngeal tumours
12. Interstitial lung disorders
  - a. Concept of chronic inflammation and fibrosis as a common factor
  - b. Types and causative agents
13. Risk factors, pathogenesis, morphology, complications of ARDS
14. Pleural effusion: causes. Differences between exudative and transudative effusion. Laboratory investigation including protein, sugar, cell count and cytology.
15. Risk factors and morphology of mesothelioma

**13. Gastrointestinal tract**

***Must know:***

1. Aetiology, risk factors, gross and microscopic pathology, and laboratory diagnosis of
  - a) Oral cancer
  - b) Benign tumours of the salivary gland-pleomorphic adenoma, Warthin's tumor
  - c) Oesophageal cancer
  - d) Stomach cancer
  - e) Colonic cancer
2. Premalignant lesions
  - a) Oral cancer (leukoplakia)
  - b) Barrett's oesophagus
  - c) Adenomatous polyp of stomach and particularly the colon. Genetic instability in colon.

3. Aetiology, pathogenesis, gross and microscopic pathology and complications of peptic ulcers
  - i. Role of *h.pylori* in the pathogenesis of gastritis, ulcers and cancers of the stomach.
4. Aetiology, risk factors if applicable, gross and microscopic morphology, and complications of the inflammatory conditions of the gastrointestinal tract:
  - i. Typhoid ulcer
  - ii. Tuberculosis
  - iii. Ulcerative colitis
  - iv. Crohn's disease
  - v. Amoebic colitis
5. Acute appendicitis

***Should know:***

6. Aetiology, pathogenesis, gross and microscopic pathology and complications of acute and chronic pancreatitis

***May know:***

7. Malabsorption syndromes
8. Sjogren's syndrome
9. Aetiology, pathogenesis, gross and microscopic pathology of pancreatic tumours

**14. Hepatic and biliary tract pathology**

***Must know:***

1. Aetiopathogenesis, morphology and complications of
  - a. Acute hepatitis
  - b. Chronic hepatitis
  - c. Cirrhosis: Including and types
2. Alcoholic liver disease:
  - a. Pathogenesis
  - b. Stages of progression of liver disease with the morphological markers of each stage
  - c. Complications
3. Tumours of the liver
  - a. Classification
  - b. Aetiopathogenesis
  - c. Morphology of hepatocellular carcinoma
4. Cholelithiasis
  - a. Aetiopathogenesis
  - b. Types of stones
  - c. Complications, including morphology of cholecystitis
5. Tumours of the gall bladder
  1. Aetiopathogenesis and morphology



6. Jaundice:

1. Classification and causes
2. Laboratory tests for differential diagnosis

7. Causes and pathogenesis of portal hypertension

**Should Know:**

8. Liver function tests

**May know:**

9. Pathogenesis of liver failure

**15. Urinary tract pathology**

**Must know:**

1. Renal structure
2. Urinalysis: routine tests done in physical, chemical and microscopic examination.
  - a. Conventional and dipstick methods
  - b. Causes of abnormal specific gravity, colour, and odour
  - c. Tests for blood, protein, bile salt, bile pigment, protein, ketones and glucose, with causes of abnormality
  - d. Types of crystals and casts found in different conditions
3. Definition and causes of nephritic and nephrotic syndrome
4. Glomerulonephritis:
  - a. Classification
  - b. Primary: proliferative, crescentic, membranous, membrano-proliferative, IgA nephropathy.
  - c. Diabetes
5. Aetiology, pathogenesis and morphology of pyelonephritis and reflux nephropathy,
6. Risk factors, classification and gross and microscopic features of:
  - a. Renal cell carcinoma,
  - b. Nephroblastoma
7. Morphological and functional changes in the kidney in hypertension
8. Urolithiasis
  - a. Pathogenesis
  - b. Types of calculi
  - c. Complications
9. Causes and morphological sequelae of obstructive uropathy
10. Renal malformations: Cystic diseases of kidneys

**Should know:**

11. Secondary glomerulonephritis: SLE, purpura, polyarteritis, amyloidosis

**May know:**

12. Acute renal failure: pathogenesis of acute tubular and cortical necrosis
13. Pathogenesis of progressive renal failure and end stage renal disease
14. Pathogenesis and morphology of interstitial nephritis
15. Cystitis
16. Risk factors, classification and morphology of carcinoma of urinary bladder
17. Pathogenesis, morphology, laboratory diagnosis and complications of urinary tract tuberculosis

## 16. Endocrine system

### ***Must know:***

1. Thyroid
  - a. Thyroid function tests
  - b. Aetiopathogenesis and morphology of Colloid and nodular goitre
  - c. Autoimmune thyroiditis
  - d. Classification, risk factors and gross and microscopic morphology of thyroid tumours
2. Multiple endocrine neoplasia: classification and lesions.

### ***Should know:***

3. Adrenal
  - a. Cortical hyperfunction
    - i. Causes
    - ii. Effects
  - b. Cortical hypofunction
    - i. Causes
    - ii. Effects
  - c. Medullary tumors: classification, gross and microscopic pathology, laboratory diagnosis, clinical features
  - d. Parathyroid
    - i. Hyperparathyroidism
      - a. Causes
      - b. Effects
    - ii. Hypoparathyroidism
      - a. Causes
      - b. Effects
  - e. Pituitary: causes and effects of pituitary hyper and hypofunction

## 17. Pathology of male reproductive system

### ***Must know:***

1. Aetiopathogenesis, gross and microscopic pathology and complications of nodular hyperplasia of prostate

2. Prostate carcinoma
  - a. Risk factors
  - b. Morphology of adenocarcinoma
  - c. Tumor markers
  - d. Spread
3. Testicular tumours
  - a. Classification
  - b. Tumour markers in diagnosis
  - c. Morphology of
    - i. Seminoma
    - ii. Embryonal carcinoma
    - iii. Yolk sac tumour
4. Tumours of male external genitalia
5. Cryptorchidism

***Should know:***

6. Semen analysis: importance of semen count, morphology and activity

18. Pathology of female reproductive system and breast

***Must know:***

1. Carcinoma cervix
  - a. Aetiopathogenesis
  - b. Premalignant lesions with morphology
  - c. Classification of invasive carcinoma
  - d. Gross and microscopic morphology of squamous cell carcinoma
  - e. Importance of cervical smear in early diagnosis
    - i. Diagnostic categories in reporting
    - ii. Follow up of indeterminate results
    - iii. Other screening tests: direct visualisation, direct visualisation with acetic acid, colposcopy for HPV infection.
2. Endometrium
  - a. Histology in different phases of the menstrual cycle
  - b. Endometrial hyperplasia: the concept of difference between hyperplasia without atypia which is an anovulatory state and hyperplasia with atypia which is a premalignant state should be emphasized, along with the morphological features
  - c. Endometrial carcinoma: risk factors, classification, morphology
  - d. Smooth muscle tumors: morphology and complications
3. Ovarian tumours
  - a. Classification

- b. Tumour markers
  - c. Morphology of serous and mucinous tumours (benign, borderline and malignant)
  - d. Morphology of teratoma, embryonal carcinoma, yolk sac tumors, dysgerminoma, krukensberg tumour
4. Gestational trophoblastic disease: risk factors and morphology of
    - a. Hydatidiform mole
    - b. Choriocarcinoma
  5. Ectopic pregnancy
  6. Breast cancer
    - a. Risk factors
    - b. Classification
    - c. Morphology of infiltrating ductal and lobular carcinoma
    - d. Prognostic factors
    - e. Diagnosis, with special reference to triple diagnosis
  7. Other disorders of the breast:
    - a. Fibrocystic disease, with reference to which features, when present, impart increased risk of breast cancer
    - b. Morphology and prognosis of fibroadenoma and phyllodes tumor

***May know:***

8. Causes of infertility
9. Pelvic inflammatory disease
10. The student should have knowledge of the common diseases of the vulva and vagina including condyloma, papilloma, and cancers.
11. Genital tuberculosis

**19. Musculoskeletal pathology**

***Must know:***

1. Aetiology, pathogenesis, morphology and complications of Osteomyelitis
  - a. Acute
  - b. Chronic
  - c. Tuberculous
2. Metabolic bone disease
  - a. Rickets
  - b. Osteomalacia
3. Bone tumours

- a. Risk factors and classification
- b. Morphology of
  - i. Osteosarcoma (with subtypes)
  - ii. Osteochondroma
  - iii. Ewing sarcoma
  - iv. Giant cell tumour

***Should know:***

4. Paget disease of bone
5. Osteoporosis

***May know:***

6. Pathology of
  - a) Muscular dystrophies
  - b) Arthritis: rheumatoid, osteoarthritis, septic arthritis, tuberculous arthritis
  - c) Tumours of jaw with special reference to ameloblastoma

## **20. Neuropathology**

***Must know:***

1. Basic CSF examination with special reference to differentiating between acute, chronic and tuberculous meningitis
2. Aetiology and pathogenesis of brain abscess
3. Brain tumours-Glioma and meningioma
4. Peripheral nerve sheath tumour: Schwannoma and neurofibroma

***May know:***

5. Alzheimer's disease
6. Prion disease
7. Cerebrovascular disease: haemorrhage, infarction and embolism

## **21. Skin and soft tissue**

***Must know:***

1. Morphological features of
  - a. Melanoma
  - b. Squamous cell carcinoma
  - c. Basal cell carcinoma
  - d. Names of common soft tissue tumours
  - e. Premalignant lesions of skin

***May know:***

2. Bullous disorders of the skin
3. Psoriasis, lupus vulgaris, lichen planus

#### IV. Practicals skills

---

- a) Identify and interpret the gross and/or microscopic features of common disorders.
- b) Perform with accuracy and reliability basic haematological procedures such as haemoglobin estimation, total and differential WBC count and peripheral blood smear staining, examination and report.
- c) Calculate the indices and interpret the relevant significance.
- d) Perform the basic laboratory haematological tests like bleeding time and clotting time.
- e) Perform a complete examination of the urine to detect any abnormalities, interpret urine analysis report and correlate with clinical features.
- f) Have basic knowledge of bone marrow examination and findings in common diseases.
- g) Perform grouping, Rh typing and Have basic knowledge of cross matching of blood.
- h) Collect and dispatch clinical samples from patients in a proper manner.
- i) Interpret abnormal laboratory values of common diseases.
- j) Acquire basic knowledge regarding lumbar puncture and its clinical significance.
- k) Acquire basic knowledge regarding sample collection, transport and clinical significance of cervical smear (papanicolou smear)

#### V. TEACHING AND LEARNING METHODOLOGY

---

Department stresses on teaching basic fundamentals of the disease process and the applied aspects relevant to the clinical subjects.

##### General Pathology

---

Taught with the help of Didactic lectures on specific topics, followed by Practicals pertaining to that topic. Besides microscopic examination, fresh specimens obtained at autopsy or surgical operations are shown. Case studies in few diseases.

##### Systemic Pathology

---

The following tools are employed:

- i) Didactic lectures: discussing a particular topic at length in an one hour lecture
- ii) Integrated teaching: are conducted by a combined team of pathologist and a clinician who discuss the pathophysiology and clinical aspects of the particular disease entity.
- iii) Case studies: The significant and common diseases are discussed in the form of a representative clinical case in which the clinical features, the course of the disease in that particular patient and relevant laboratory investigations are discussed by a faculty in an interactive manner in small groups. This is followed by demonstration of the gross and microscopic features of the disease in that case by the pathologist. This is followed by clinico-pathologic correlation.
- iv) Seminars are conducted for students with a faculty as a moderator.
- v) Problem based Learning: Students are given case scenario with laboratory tests to resolve with faculty as a facilitator.
- vi) Practicals
  - a) Deals with demonstration of gross, and/or microscopic features of the disease entities.
  - b) Basic tests in hematology, blood banking and Clinical Pathology are demonstrated and students are made to perform them under supervision.
  - c) Case charts of diseases are given as assignments and discussed.

vi) Clinical case demonstration

Patients of a particular disease are demonstrated to the students by a clinical faculty in the ward, discussing the clinical features in the patient which provides them a real-life experience of studying a disease as it presents in a patient.

By a combination of above modalities/tools, student learns applied aspects of the disease process.

## VI. Areas of Integrated teaching

---

Integrated Topics	Departments
Autoimmune disorders	Medicine, pharmacology
HIV/AIDS	Microbiology, pharmacology
Iron defeciency Anaemia	Community Medicine, Biochemistry, Medicine, Pharmacology
Leukemia	Pediatrics, Medicine
Hemophilia	Pediatrics, Transfusion Medicine
Tuberculosis	Community medicine, Pulmonary Medicine, Microbiology, Pharmacology
Jaundice	Medicine, Surgery, Biochemistry, Microbiology
Cirrhosis	Medicine, surgery
Ischaemic heart disease	Community Medicine, Medicine, Pharmacology
Diabetes mellitus	Community Medicine, Biochemistry, Medicine, Pharmacology
Peptic ulcer	Surgery, Pharmacology
Carcinoma breast	Surgery
Carcinoma cervix	Obstetrics & Gyaecocology
Bone tumours	Orthopaedics, Radiology
Hansen disease	Dermatology, microbiology, pharmacology
Nephrotic syndrome and nephritis	Pediatrics, Medicine, Biochemistry

## VII. Evaluation of students

---

- A. Formative assessment: MCQ, Tutorials and Objective Structured Practical Examination (OSPE)
- B. Summative assessment: Internal assessment and Professional examination

## VIII. EXAMINATION AND MARKS DISTRIBUTION (as per previously approved format)

---

**Total Marks: 300**

**Internal Assessment: 150**

**Professional Examination: 150**

### INTERNAL EXAMINATION PATTERN

Examination	Weightage in percentage
III Semester End term Examination	25%
IV semester End term Examination	25%
Preliminary Examination	50%
<b>Total</b>	<b>100%</b>

## DISTRIBUTION OF PATHOLOGY TOPICS FOR FINAL EXAMINATION

### Paper-I (General Pathology and Hematology)

Sno.	Name of Topic	No. of MCQs to be set
<b>General Pathology (100 MCQs)</b>		
1.	Cell injury and adaptation	10
2.	Inflammation and repair	10
3.	Hemostasis/ Circulatory disturbances	13
4.	Neoplasia	20
5.	Immunopathology	17
6.	Infectious pathology	14
7.	Genetic and Environmental diseases	12
8.	Childhood diseases	04
<b>Hematology (100 MCQs)</b>		
9.	RBC Disorders	30
10.	WBC disorders	30
11.	Lymphoreticular system	10
12.	Diseases of Coagulation	15
13.	Blood Banking	15
	<b>TOTAL</b>	<b>200</b>

### Paper-II (Systemic Pathology)

Sno.	Name of Topic	No. of MCQs to be set
1.	Cardiovascular pathology	20
2.	Respiratory pathology	15
3.	Gastrointestinal Tract	30
4.	Hepatic and Biliary Tract pathology	15
5.	Urinary tract pathology	20
6.	Endocrine system	10
7.	Pathology of male reproductive system	15
8.	Pathology of female reproductive system and Breast	40
9.	Bone and joint pathology	15
10.	Neuropathology	10
11.	Skin and soft tissue	10
	<b>Total</b>	<b>200</b>

### PATTERN OF PRACTICAL EXAMINATION AND MARKS DISTRIBUTION

PRACTICALS (OSPE)	Total = 100 Marks
<b>Observation and reasoning: 12 stations</b>	
Five histopathology slides	(5 x 5 marks)
One Hematology slide	(1 x 5 marks)
Four specimens	(4 x 5 marks)



Two Instrument identification	(2 x 5 marks)
One observation and interpretation of test ESR/PCV/Hb	(1x5 marks)
<b>Performance/ skill evaluation: 4 stations</b>	
<b>Urine Chemical Test:</b> (Test for Protein/sugar/ketone bodies): Student will have to perform one urine chemical test by conventional method. Student has to write the result, inference and give answer to an additional question asked. Performance of this test will be observed by 1 examiner	(1x5 marks)
<b>Blood grouping exercise by slide method:</b> Student has to perform blood grouping. Student has to write the result and inference Performance of this test will be observed by 1 examiner.	(1x5 marks)
<b>Test for Hemoglobin:</b> Student has to perform estimation of hemoglobin by Sahli's hemoglobinometer. Write observation, inference and give a final diagnosis.	(1x5 marks)
<b>Comment on Peripheral smear:</b> Reporting and interpretation	(1x5 marks)
<b>Analytical skill-Case based test/ Interpretation to assess clinical application: 2 stations</b>	
<b>Clinical Pathology:</b> A case history will be given and urine sample will be kept. Student has to perform Urine analysis by dipstick method. Write observation, inference and give a final diagnosis based on case history and test findings.	(1x5 marks)
Interpretation of Two case charts based on Clinical and Laboratory data/ hematology case chart provided.	(2x5 marks)