

## INDIAN INSTITUTE OF TECHNOLOGY, ROORKEE

1.	Reference	Advt. No. IITR/Rect Cell/2023/1 dated 13-07-2023
2.	Name of Post	Junior Technical Superintendent (Pathology) (Group 'B')
3.	Mode of Recruitment	Direct Recruitment

### Tier-I Examination (50 marks)

1. The 2 hours Optical Response Sheet (ORS) based examination will comprise of multiple-choice questions with one correct answer.
2. One (1) mark will be awarded for each correct answer and minus one by three  $\left(-\frac{1}{3}\right)$  mark for each incorrect answer.
3. The unanswered questions will not attract negative marks.
4. Question paper will have two sections namely General Section and Post Related Section.

#### **General Section (20 Marks)**

- **English Language and Comprehension:** English Grammar, Sentence Correction and Completion, Paragraph Summary, Reading Comprehension & Inferences, Verbal Analogies & Critical Reasoning
- **Mathematics & Numerical Ability:** Arithmetic - upto 10th Standard
- **General Awareness and Current Affairs:** Current Affairs, Government Schemes. Economics, Geography, Indian History, Indian Polity, Indian Constitution – upto 10th Standard
- **Computer proficiency:** Knowledge of MS Windows and MS Office, Internet, and email system.

#### **Post Related Section (30 Marks)**

##### **Basic Pathology and Microbiology:**

Definitions and Classification of diseases,

- Inflammatory diseases – viral and fungal, Parasitic.
- Degenerative diseases – Fatty degeneration, Amyloid etc.
- Tumors – Definition, etiology & classification.

Disturbances in blood flow, pigment disorders, hereditary diseases, C.V.S. Blood vessels, Heart, Respiratory system, G.I. tract, Liver Lymphatic system, genitourinary system, skeletal system, Blood, Central Nervous system, Endocrine system Clinical Pathology – Normal composition of blood; diseases of RBCs, WBCs, Platelets. Coagulation factors and disorders Blood groups and cross – matching, Blood transfusion, in common diseases, CSF and body fluids, Gastric & Duodenal contents, parasites, Introduction and historical background, Classification special, Characteristics of organisms bacteria, Asepsis, Disinfection, Antiseptics, Sanitation, Infection, Immunity, Allergy, Study of pathogenic organisms, Non-pathology organisms, Virus and fungus, Parasitic diseases- their stance in India with lab Diagnosis.

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### Tier-II Examination (only for shortlisted candidates) (50 marks)

#### **Job Oriented Test (25 Marks)**

1. The 1 hour Optical Response Sheet (ORS) based examination will comprise of multiple-choice questions with one correct answer.
  2. One (1) mark will be awarded for each correct answer and minus one by three  $\left(-\frac{1}{3}\right)$  mark for each incorrect answer.
  3. The unanswered questions will not attract negative marks.
- General-Haematology: Origin, development, morphology, maturation, function and fate of blood cells, nomenclature of blood cells.
  - Various methods of blood collection, anticoagulants-mechanism and uses.
  - Basic concepts of automation in haematology

- Counting chamber- hemocytometry. Enumeration of RBC including various counting chambers, diluting fluids for RBC count.
- Haemoglobinometry. Principles and methods of quantitating Hb. Concentration of blood including knowledge of errors and quality control in various method. Abnormal hemoglobin and its investigation.
- ESR: introduction, factors affecting ESR, principles and methods of determining ESR, increasing and decreasing conditions of ESR.
- CBC (complete blood cell count)
- WBC: introduction, development of WBC, diluting fluids. Absolute eosinophil count, errors in sampling, mixing, diluting and counting.
- Clinical pathology: urine and stool testing, Montoux test.
- Electrolyte testing: Na, K, Ca, Cl test
- Thyroid testing: T3, T4, TSH (thyroid profile)
- Cell counting, advantages and disadvantages, uses and mechanism of cell counting, quality control in cell counts.
- Preparation of peripheral smear and bone marrow smear. Thin smear, thick smear. Buffy coat smear, wet preparation. Romanowsky stain. Preparation advantages and disadvantages.
- Principle and methods of staining of Blood smears and bone marrow smears. Supravital stain. Reticulocyte count. Heinz bodies.
- Description of morphology of normal and abnormal red cells. Blood differential WBC counting. Recognition of abnormal cell. Anaemia – definition etiology classification and laboratory diagnosis.
- Methods of identification and estimation of abnormal hemoglobin including spectroscopy. Hemoglobin electrophoresis. Alkali denaturation Test. Sick cell preparation.
- Various benign leucocyte reaction – Leukocytosis. Neutrophilia, Eosinophilia, Lymphocytosis. Infectious mononucleosis. leucopenias.
- Leukemias – definition, causes, classification, detection of leukemia. Total leucocyte count in leukemias. Multiple myeloma.
- Blood Coagulation and disorders of hemostasis. Classification of coagulation factors, Principles and methods of assessment of coagulation. BT, CT, Prothrombin time, partial thromboplastin time, thromboplastin regeneration time
- Thrombocytopenia, thrombocythemia, platelet function test, platelet count. Clot retraction test. Platelet factor III Test.
- LE cell – definition, morphology causative agents. Various methods of demonstrating LE cells. Blood parasites. Malaria, LD bodies, microfilaria and methods of demonstration.
- Preparation of donor and collection of blood. Solution and apparatus used. Storage of blood. Preparation and storage of plasma. Preparation of packed red cells.
- Principles involved in Blood grouping. ABO system and the methods used. Factors influencing the results of blood grouping, Rh system. Rh antigen. Principles and methods used.
- Cross matching. Compatibility test, direct and indirect Coomb's test – Principle involved and the methods used. Blood transfusion and its Hazards.
- Biochemistry: Lipid profile, Liver function test, Kidney function test, Serum uric acid test, RA factor, CRP, Vitamin D3.
- Serological detection of HIV, HCV, HBsAg, VDRL, Dengue, etc. by card method.
- Immunology testing: IgG, IgA, IgM, etc.
- Calibration and Validation of Clinical Laboratory instruments

### **Skill Test (25 Marks)**

The skill assessment test is to evaluate the skill-based performance of candidates on various procedures/instruments.