

RRB Lab Assistant Grade II Syllabus Blueprint

Official Examination Scheme & Comprehensive Curriculum Guide by Solotutes.com

Notification: RRB CEN 05/2026 (Paramedical Categories)

Post: Laboratory Assistant Grade II — 31 Vacancies **Pay Scale:** Level-3 (7th CPC)

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1. Official Recruitment Overview & Essential Eligibility

Under Centralised Employment Notice (CEN) No. 05/2026, the Railway Recruitment Board (RRB) has notified 31 vacancies for the post of **Laboratory Assistant Grade II** across Zonal Railways. This post represents a specialized technical opportunity for candidates holding recognized qualifications in Medical Laboratory Technology (DMLT / MLT).

RECRUITMENT PARAMETER	OFFICIAL SPECIFICATION UNDER CEN 05/2026
Designation	Laboratory Assistant Grade II
Total Vacancies	31 Posts
Essential Educational Qualification	10+2 in Science (with Physics and Chemistry) plus Diploma in Medical Laboratory Technology (DMLT) from a recognized institution / State Medical Faculty.
Age Limit	18 to 33 Years (as on July 1, 2026). Standard government age relaxations apply for OBC, SC/ST, PwBD, and Ex-Servicemen.
Medical Standard	B-1 Standard (as prescribed by Railway Medical Manual).
Selection Process	Single Stage Computer Based Test (CBT), Document Verification, and Medical Examination.

2. CBT Examination Pattern & Scoring Matrix

The Computer-Based Test consists of 100 Multiple Choice Questions (MCQs) for 100 marks to be answered in 90 minutes. Final merit is determined 100% by the performance in this CBT.

SECTION	SUBJECT DOMAIN	QUESTIONS	MARKS	WEIGHTAGE
Part 1	Professional Ability (Medical Laboratory Technology Core)	70	70	70.0%
Part 2	General Science (CBSE Class 10 Standard)	10	10	10.0%
Part 3	General Arithmetic, Intelligence & Reasoning	10	10	10.0%
Part 4	General Awareness & National Health Programmes	10	10	10.0%
Total	Full CBT Question Paper	100	100	100.0%

Scoring Rules & Negative Marking

- **Negative Marking: 1/3rd mark (0.33 mark)** will be deducted for each incorrect answer. Unattempted questions attract no penalty.
- **Duration:** 90 minutes (120 minutes for eligible PwBD candidates with a scribe).
- **Minimum Qualifying Marks:** UR / EWS: 40%, OBC-NCL: 30%, SC: 30%, ST: 25%.

3. Professional Ability Detailed Syllabus (70 Marks)

The 70-mark Professional Ability section covers standard Diploma in Medical Laboratory Technology (DMLT) curricula across 8 specialized diagnostic laboratory disciplines:

Unit 1: Fundamentals of MLT, Lab Safety & Quality Assurance

- Organization, layout, cleaning, and maintenance of clinical laboratories.
- Laboratory equipment operation: Microscopes (Abbe condenser, oil immersion), autoclaves, hot air ovens, centrifuges, analytical balances, colorimeters, spectrophotometers, water baths.
- Biomedical Waste Management (BMW) Rules 2016: Segregation categories, color-coded bags/bins (Yellow, Red, White, Blue), and disposal methods.
- Biosafety levels (BSL-1 to BSL-4), universal safety precautions, laboratory hazard management, and first aid.
- Quality Assurance: Internal Quality Control (IQC), External Quality Assessment Schemes (EQAS), Levey-Jennings charts, Westgard multi-rules (1_{3s}, 2_{2s}, R_{4s}).

Unit 2: Histopathology, Tissue Processing & Cytology

- Tissue Fixation: Principles, chemical fixatives (10% neutral buffered formalin, Bouin's fluid, Zenker's fluid, Carnoy's fluid), fixation artifacts.
- Tissue Processing: Dehydration (graded alcohols), clearing (xylene), paraffin wax infiltration (melting point 56°C-58°C), and embedding.

- Microtomy: Rotary microtome parts, knives, clearance angles (3°-5°), section cutting, floating out, and slide mounting.
- Staining Techniques: Hematoxylin and Eosin (H&E) staining principle and protocol; Special stains: PAS, Ziehl-Neelsen, Perls' Prussian blue, Masson's trichrome.
- Cytopathology: Exfoliative cytology, collection and wet fixation (95% ethanol) of Pap smears, Papanicolaou staining, and FNAC processing.

Unit 3: Clinical Biochemistry

- Standard solutions, molarity, normality, buffer systems, and pH measurement.
- Carbohydrate Metabolism: Blood glucose estimation (GOD-POD enzymatic method), oral glucose tolerance testing (OGTT), HbA1c estimation and clinical significance.
- Renal Function Tests (RFT): Serum creatinine (Jaffe's alkaline picrate method), blood urea nitrogen (BUN), serum uric acid, creatinine clearance.
- Liver Function Tests (LFT): Serum bilirubin (van den Bergh reaction), AST/SGOT, ALT/SGPT, Alkaline Phosphatase (ALP), serum albumin (BCG method), A/G ratio.
- Lipid Profile: Serum cholesterol (CHOD-PAP method), triglycerides, HDL, LDL, VLDL.
- Electrolytes & Enzymes: Serum sodium, potassium, chloride; Cardiac markers (Troponins, CK-MB); Serum amylase and lipase.

Unit 4: Clinical Microbiology & Antimicrobial Susceptibility Testing

- Bacterial anatomy, growth curve, sterilization methods (autoclave parameters, dry heat).
- Culture Media: Simple media (nutrient agar), enriched media (blood agar, chocolate agar), selective media (MacConkey agar, TCBS, LJ medium), transport media.
- Staining Procedures: Gram staining mechanism, Ziehl-Neelsen (Acid-Fast) staining of Mycobacterium tuberculosis, Albert's stain.
- Bacterial Identification: Staphylococci (coagulase test), Streptococci, Enterobacteriaceae (E. coli, Salmonella), Vibrio cholerae.
- Antimicrobial Susceptibility Testing (AST): Kirby-Bauer disc diffusion method on Mueller-Hinton agar, McFarland standards, MIC determination.
- Diagnostic Mycology & Virology: 10% KOH mounts, India ink capsule staining for Cryptococcus neoformans; Rapid card tests (Dengue, HIV, HBsAg, HCV), ELISA principle.

Unit 5: Clinical Parasitology & Stool Examination

- Stool Examination: Collection, macroscopic appearance, saline and iodine wet mounts.
- Intestinal Protozoa: Entamoeba histolytica vs. E. coli cysts and trophozoites, Giardia lamblia (falling-leaf motility).
- Helminthic Ova: Ascaris lumbricoides, Ancylostoma duodenale (hookworm), Trichuris trichiura (barrel-shaped eggs), Enterobius vermicularis (Scotch tape technique).
- Blood Parasites: Plasmodium species (P. vivax, P. falciparum crescent gametocytes), thick and thin smear examination, Leishmania, Microfilaria nocturnal periodicity.

Unit 6: Haematology

- Blood composition, anticoagulants (EDTA, 3.2% Citrate 1:9 ratio, Heparin, Fluoride).
- Routine Hematology: Cyanmethemoglobin (HiCN) method for Hemoglobin, Neubauer hemocytometer cell counts (RBC, TLC, platelets), hematocrit (PCV).
- Red Cell Indices: MCV (femtoliters), MCH, MCHC, RDW.
- Erythrocyte Sedimentation Rate (ESR): Westergren and Wintrobe methods.
- Reticulocyte count using supravital stains (New Methylene Blue).
- Peripheral Blood Smear: Leishman's staining, morphological features of anemias (iron deficiency microcytosis, megaloblastic anemia), leukemias overview.
- Coagulation Testing: Bleeding Time, Clotting Time, Prothrombin Time (PT/INR), aPTT.

Unit 7: Blood Banking & Transfusion Medicine

- ABO and Rh blood group systems: Forward (cell) grouping and Reverse (serum) grouping techniques.
- Cross-matching (major and minor), Direct and Indirect Coombs (Antiglobulin) tests.
- Donor screening criteria, mandatory testing for TTIs (HIV, HBV, HCV, Syphilis, Malaria).
- Blood Component Preparation & Storage: PRBC (2°C to 6°C), FFP (-18°C or colder), Platelet concentrates (20°C to 24°C with agitation).
- Hemolytic Disease of the Newborn (HDN) and blood transfusion reactions.

Unit 8: Clinical Pathology & Body Fluid Analysis

- Urine Analysis: Physical examination, chemical strip testing, sulfosalicylic acid (SSA) test for proteinuria, Rothera's test for ketone bodies; Microscopic deposits (RBC casts in glomerulonephritis, pus cells, crystals).
- Cerebrospinal Fluid (CSF) Analysis: Physical appearance, xanthochromia, cell count, protein, glucose, and microbiological staining.
- Examination of pleural, ascitic, synovial fluids (transudates vs. exudates), and routine Semen analysis.

4. Universal Non-Technical Syllabus Breakdown (30 Marks)

4.1 General Science (10 Questions / 10 Marks)

- **Physics:** Units, motion, work and energy, gravitation, fluid pressure, sound, optics (mirrors and lenses), electricity, magnetism.
- **Chemistry:** Chemical reactions, acids, bases and salts (pH scale), metals and non-metals, carbon compounds, periodic table trends.
- **Life Sciences:** Cell structure, plant and animal tissues, human physiology, nutrition, endocrine control, genetics, disease pathogens, immunization.

4.2 General Arithmetic, Intelligence & Reasoning (10 Questions / 10 Marks)

- **Arithmetic:** Number system, BODMAS, decimals, fractions, LCM & HCF, ratio and proportion, percentages, profit and loss, simple/compound interest, time and work, time-speed-distance, mensuration.
- **Reasoning:** Analogies, alphabetical and number series, coding-decoding, mathematical operations, direction sense, blood relations, syllogisms, Venn diagrams, data interpretation.

4.3 General Awareness & Healthcare Schemes (10 Questions / 10 Marks)

- National and international current affairs of the past 6-8 months.
 - Public health initiatives: Ayushman Bharat (PM-JAY), National Health Mission, disease elimination schemes.
 - Indian Constitution and Polity, Indian Geography, Freedom Struggle, and Basic Indian Economy.
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5. High-Yield Preparation Strategy for Solotutes MLT Aspirants

1. **Focus on Laboratory Core:** Over 70% of questions in the MLT section revolve around Clinical Biochemistry, Haematology, and Microbiology. Memorize standard reagent compositions, stain steps, and normal reference ranges.
2. **Master Quality & Safety Rules:** Questions on Biomedical Waste Management (BMW 2016), Westgard multi-rules, and storage temperatures of blood components are guaranteed high-scoring areas.
3. **Sharpen Non-Technical Skills:** Dedicate 30 minutes daily to practicing Class 10 arithmetic and general science questions to secure the baseline 20+ non-technical marks.
4. **Practice Timed Mocks on Solotutes.com:** Regular full-length CBT practice trains candidates to handle negative marking and improves speed on calculation-based biochemistry questions.