

**Syllabus and marking system for recruitment of Technical Assistant, Technician-1 and Lab attendant-1 posts advertised vide Notification No. 01/2023 at ICMR NARFBR**

- a) Distribution of marks (Total: 100 marks)
- b) Multiple choice-based questions – 100 nos. (1 mark / each correct answer)
- c) Negative marking: -0.25 / each incorrect answer
- d) Level of questions: Technical Assistant – Diploma /Graduate level  
Technician-1 – Diploma level  
Lab Attendant – 10<sup>th</sup> / I.T.I. level
- e) Syllabus as per the following for various categories:

**Technical Assistant (Life Science):**

- General knowledge and current affairs – 10 marks
- Mental ability and reasoning – 10 marks
- Quantitative aptitude – 10 marks
- Computer knowledge – 10 marks
- Subject-specific – 60 marks

*Subject syllabus:*

General anatomy (different body parts and organs) – Physiology (blood and organs) – General biochemistry (proteins, carbohydrates, fats, nucleic acids, acids/bases, buffer) – General microbiology (history, microscopes, structure and reproduction of bacteria and viruses, staining methods, safety in microbiology, bacterial and viral diseases) – Immunology (Innate and acquired immunity, antigen-antibody reactions, ELISA) – Role of arthropods in transmission of diseases – General biotechnology (RNA, DNA, PCR, Real Time PCR, agarose gel electrophoresis) – Clinical biochemistry (Specimen collection, processing and handling in clinical laboratory, anticoagulants for various tests, principles of estimation of various blood and urine parameters) – Hematology (Origin, development, morphology, maturation, function and fate of blood cells, nomenclature of blood cells, blood grouping) – Organ collection for histopathology, tissue processing, staining – Ethics and Indian guidelines for animal experimentation – Animals used in experiments – Care, management and breeding of laboratory animals – Environmental and physical requirements for different experimental small and large animals – Diseases of small laboratory rodents, Clinical manifestation, diagnosis, prevention and control of zoonotic diseases, Animal Welfare Board of India - their role, functions and current status, Role and function of CCSEA, Feeding of sheep, goat and pigs, Vaccination/deworming schedules, General anaesthesia and its management in small and large animals

**Technical Assistant (HVAC):**

- General knowledge and current affairs – 10 marks
- Mental ability and reasoning – 10 marks
- Quantitative aptitude – 10 marks
- Computer knowledge – 10 marks
- Subject-specific – 60 marks

*Subject syllabus:*

Heating and ventilation - Refrigeration and Air conditioning -Temperature Measurement and Conversion - The Refrigeration Cycle - Heat and Mass Transfer - Strength of Materials - Thermal Engineering - Kinematics of Machines - Dynamics of Machines - Materials Science and Engineering - Fluid Mechanics - Machine Design - CAD/CAM - IC Engine - Automobile Engineering - Mechanical Vibration - Industrial Automation – Air exchange, air velocity measurement – VAV system - Relationship between temperature and humidity– Attaining positive pressure or negative pressure laboratory rooms – Air handling units – HEPA filters –Clean room validation tests – ISO clean room classifications - Elements of Electrical Engineering - Electrical and Electronics circuits - Direct Current (DC) - Alternating Current (AC) - Semiconductors

**Technical Assistant (Instrumentation):**

- General knowledge and current affairs – 10 marks
- Mental ability and reasoning – 10 marks
- Quantitative aptitude – 10 marks
- Computer knowledge – 10 marks
- Subject-specific – 60 marks

*Subject syllabus:*

Analytical Instrumentation, Biomedical Instrumentation, Pharmaceutical Instrumentation, Industrial Instrumentation, Optoelectronics and Laser Instrumentation, Linear IC Applications, Control Systems, Microprocessor & Microcontrollers, Signals and Systems, Electronic Measurements, Transducers Engineering ,Applied Physics, Basic Electrical Engineering, Electronic Devices and Circuits, Measurement Of Electrical Parameters, Power And Energy Measurements, Analog And Digital Instruments, Display And Recording Devices, Principles of viewing and interpreting X-ray films, classification of radiographic lesions. Contrast radiography: classification, materials, uses, indications and contra indications. Handling of X-ray machine, Principles of ultrasonography and its applications in veterinary Science, Awareness on principles of radiation therapy, Isotopes and their uses in diagnosis and therapy; Principles and application of CT scan

**Technician – 1 (Animal Facility)**

- General knowledge and current affairs – 10 marks
- Mental ability and reasoning – 10 marks
- Quantitative aptitude – 10 marks
- Computer knowledge – 10 marks
- Subject-specific – 60 marks

*Subject syllabus:*

General anatomy (different body parts and organs) – Physiology (blood and organs) – General biochemistry (proteins, carbohydrates, fats, nucleic acids, acids/bases, buffer) – General microbiology (history, microscopes, staining methods, safety in microbiology, biomedical waste disposal) – Immunology (antibody types, ELISA) – General biotechnology (RNA, DNA, PCR, Real Time PCR, agarose gel electrophoresis) – Clinical biochemistry (Specimen collection, processing and handling in clinical laboratory, anticoagulants for various tests) – Hematology (function and fate of

blood cells, nomenclature of blood cells, blood grouping, hemocytometry) – Organ collection for histopathology, tissue processing, staining – Ethics and Indian guidelines for animal experimentation – Animals used in experiments – Care and management of laboratory animals – Environmental and physical requirements for different experimental small and large animals

### **Technician – 1 (HVAC)**

- General knowledge and current affairs – 10 marks
- Mental ability and reasoning – 10 marks
- Quantitative aptitude – 10 marks
- Computer knowledge – 10 marks
- Subject-specific – 60 marks

#### *Subject syllabus:*

Refrigerator & domestic air-conditioners, Commercial RAC plants, Primary & secondary refrigerants, Lubrication, Thermal insulation, Gas charging, testing & faults diagnosis, Fitting & Welding allied, Water cooled condenser, cooling tower, water softening plants, chillers & Refrigerant controls, Erection of plants, Ducts, HVAC, VAV system, Psychometric, Heat load estimation, Commissioning & preventive maintenance of different plants Basics of Electricals & Electronics, Relationship between temperature and humidity – Attaining positive pressure or negative pressure laboratory rooms – Air handling units – HEPA filters

### **Technician – 1 (Electrical)**

- General knowledge and current affairs – 10 marks
- Mental ability and reasoning – 10 marks
- Quantitative aptitude – 10 marks
- Computer knowledge – 10 marks
- Subject-specific – 60 marks

#### *Subject syllabus:*

Conductor, semiconductors, Insulator and electric cables, Tools for an Electrician, Soldering and D.C theory, Basic Electricity, Electrical accessories, Electro-Chemical effect and Chemical cell, Magnetism and electromagnetism, Occupational Safety and Health, alternating current theory, ear thing and Basic electronics. Transistor, Amplifiers, Oscillators, Specific Solid-State devices, Digital Electronics, Electrical wiring, Direct Current Generator, Direct Current Motor, Transformer and Electrical measuring instruments, 3-Phase induction motors, Single-Phase induction motors, Alternator, Synchronous motor, Converters, D.C. machine, and short transformer winding, A.C. Machine winding, Illumination, Industrial wiring, House wiring layout, Machine control panel, Electrical instrument, Electrical power generation, Electrical power transmission, Underground cables, Power distribution, Speed control and maintenance of electric machines.

### **Lab attendant– 1 (Animal Facility)**

- General knowledge and current affairs – 10 marks
- Mental ability and reasoning – 10 marks
- Quantitative aptitude – 10 marks
- Computer knowledge – 10 marks
- General Science (up to 10<sup>th</sup> level) – 60 marks

**Lab attendant– 1 (Engineering services)**

- General knowledge and current affairs – 10 marks
- Mental ability and reasoning – 10 marks
- Quantitative aptitude – 10 marks
- Computer knowledge – 10 marks
- Subject specific – 60 marks

*Subject syllabus:*

Basics of Electricity, Basic of Machines, Basic of R & AC, Basic of Fitting, Basics of Welding, Basics of Plumbing, Units of measurements.