

INDIAN INSTITUTE OF TECHNOLOGY MADRAS, CHENNAI-600036.

Advertisement No. IITM/R/4/2024 dated 11.03.2024

Syllabus & Scheme of Examination

Post: Junior Technical Superintendent

Stream: Biology/Life Science

LEVEL-1 Multiple Choice Question Test

(100 Marks)

PART – A

(30 Marks)

1. **Quantitative aptitude:** Number systems, simplification, decimals, fractions, LCM, HCF, ratio & proportion, percentage, log and trigonometric functions, solutions of simple equations (linear and quadratic), basic statistics – mean and standard deviation, profit & loss, discount, simple & compound interest, mensuration, time & work, time & distance, tables & graphs.
2. **Logical reasoning aptitude:** Analogies, similarities, differences, space visualization, analysis, judgment, decision making, visual memory, discrimination, observation, relationship concepts, arithmetical reasoning, verbal and figure classification
3. **Computer-related aptitude:** Hardware, software, operating systems, basic operations in MS Office - Word, Excel, PowerPoint
4. **Language aptitude:** Comprehension, vocabulary, and basic grammar in English.
5. **General awareness aptitude:** Current events, general knowledge, Indian history, Indian constitution, basic geography.

PART – B

(70 Marks)

1. **Biochemistry:** Water and polarity; Hydrogen bonds, Acids, bases and pH; Buffers; Biomolecules; Carbohydrates, lipids, proteins, nucleic acids, Enzyme kinetics; Metabolism, Glycolysis, Kerb's cycle; Electron transport chain and oxidative phosphorylation.
2. **Cell Biology:** Prokaryotic cells; Eukaryotic cells; Cell Wall, cell membrane, cytoskeleton, nucleus, chloroplast, mitochondria, endoplasmic reticulum, Golgi bodies, ribosomes, lysosomes, vacuoles; Cell cycle and cell division; mitosis and meiosis.
3. **Molecular Biology:** Genetic materials; DNA and RNA; replication, transcription, translation, splicing; Polymerase chain reaction; Real-time PCR, Plasmid vectors; cloning and expression of proteins in prokaryotic and eukaryotic systems; promoters and enhancers; DNA sequencing.
4. **Microbiology:** Bacteria; Archaea; Microbial eukarya; Bacterial Classification – Five kingdom concepts, The Bergey's Manual of bacterial classification, modern concepts of 16 RNA based classification; Bacterial genetics – outlines of transduction, transformation, conjugation, gene regulation and cloning; Bacterial growth – cell division, population growth, effect of temperature and pH; Classification and importance of other microbial groups – viruses, protozoa, fungi, algae, nematodes.
5. **Genetics:** Mendelian laws of segregation and independent assortment, heredity and environment, Modified Mendelian ratios; Gene mapping; Chromosomal aberrations and gene

mutations, Sex determination; Monogenic and polygenic disorders.

6. Bio-analytical Techniques: Foundations of UV and visible light spectroscopy-Qualitative and quantitative absorption measurements, NMR spectroscopy, X-ray crystallography; General principle of electrophoresis and chromatography; Microscopic analysis techniques.

LEVEL – 2 Trade Test

- **Trade Test** - Syllabus as above under Part-B for Level-1 Multiple Choice Question Test

Scheme of Examination:

Level	Type of Test	Time	Details	Weightage for the final result
Level -1	Multiple Choice Question Test	Time: 120 Minutes	100 Objective Questions – 100 Marks	70 %
Level-2	Trade Test	Time: 90 minutes approximately	Practical Trade Test	30 %

- A minimum of 5X candidates shall be shortlisted (for X number of posts advertised) for the Level-2 Trade Test based on their performance in the Level-1 Multiple Choice Question Test.

NOTE:

- a) The medium of examination will be ENGLISH
- b) The questions will generally be on the minimum qualification level i.e. Graduation.
- c) There shall be no negative marking for wrong answers.
- d) **The Level-1 Multiple Choice Question Test is tentatively scheduled to be held on 07th February 2025 at TCS iON Centres in Chennai.**