Syllabus for the post of JUNIOR TECHNICAL ASSISTANT (Bioscience & Bioengineering)

(A) WRITTEN TEST

Cell & Molecular Biology: Cell types, organization, cellular organelles, central dogma in Molecular Biology, DNA, RNA, proteins, DNA replication, transcription, translation, regulation of gene expression, horizontal gene transfer, cell communication, cell cycle, mitosis, meiosis

Microbiology: Types of microorganisms, microbial physiology and metabolism, microbial genetics, microbial growth and enumeration, applications of microorganisms

Biochemistry: chemicals of life, water as vital essence of life, macromolecules carbohydrates, fats, proteins, lipids, enzymes, enzyme kinetics, enzyme regulation, metabolism, catabolism, anabolism, glycolysis, TCA cycle, oxidative phosphorylation

Immunology: Innate and adaptive immune systems and their components, Antibody-antigen interactions, serodiagnosis, recent knowledge and applications concerning immunity to various infections

Basic statistics: Sampling and its Techniques; Sample Mean, Median, Mode Variance; Random Samples and Random Numbers, Sample SD, SEM; Idea of Significance, Correlation of Measurements, and Significance Tests.,

Molecular diagnosis: PCR, RT-PCR, vectors, primer designing, ELISA, Bioethics, biosafety for disposal of laboratory materials (microbes, animal and plant tissues), Cell culture (Animal, Human, Microbial), Cell quantification techniques, flow cytometry, cell enumeration, assessment of cell death

(B) SKILL TEST

1. Laboratory safety considerations
2. Operation of autoclave
3. Reagent & Buffer preparation
4. Slide preparation for Microscopy
5. Uses of various microbiological and mammalian cell culture media
6. Dilution plating
7. Measuring enzyme activity
8. Enumeration of microbial culture by haemocytometer.
9. Extraction of Biomolecules from various sources
10. Quantification of Biomolecules
11. Separation methods for Biomolecules
12. Recombinant DNA technology
13. Principles of Microscopy (light and fluorescence)
14. Basic spectroscopic techniques
15. Principles of PCR: Endpoint and real time

Other general skills for trade test

1. Practical knowledge (including safe handling) of analytical devices
2. Analysis of Equipment technical specifications
3. General equipment maintenance & usage logging
4. Annual maintenance and calibration of equipment
5. Maintenance of consumable stocks
6. Effective oral & written communication skills
7. General knowledge & aptitude
8. Basic computer knowledge and effective usage of Microsoft office
9. Laboratory management
10. Installation & maintenance of software

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