



भारतीय प्रौद्योगिकी संस्थान जोधपुर Indian Institute of Technology Jodhpur

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

Written Test

Cell culture (Animal, Human, Microbial), Cell quantification techniques, flow cytometry, cell enumeration, assessment of cell death, Immunoassays, ELISA, classification of biomaterials, physical, mechanical, chemical and surface properties of biomaterials, biomaterial testing, nanomaterial synthesis & characterization.

Microbial and molecular Genetics, genotyping methods, Polymorphisms, karyotyping, mutations & mutagens, Cloning, DNA/RNA isolation, plasmid DNA isolation, transformation, restriction endonucleases, vectors, primer designing, PCR, RT-PCR, Basic bioinformatics (Sequence alignment, Biological databases, phylogenetic analysis)

identification of microbes (differential staining, biochemical tests), microbial classification, taxonomy, phylogeny, microbial metabolism, transformation, transduction, conjugation, mutagenesis (random and site directed).

Bioreactors, enzyme kinetics, microbial growth kinetics, batch and continuous processes.

Biosafety and biosafety levels, Light Microscopy (Fluorescence, phase-contrast, dark field, bright field, Confocal), Electron Microscopy (SEM, TEM), Spectroscopy (UV-Visible, FTIR, CD, Fluorescence), DNA Sequencing, Next-generation sequencing, Protein Sequencing, Centrifugation, autoclaving, gel-electrophoresis, bio-hazard waste handling, Gas Chromatography, Mass Spectroscopy, GC-MS, Tandem MS/MS, HPLC,

Biomolecules, Bioenergetics, buffers and pH, Enzymes, basic catabolic pathways (EMP, ED, Citric acid cycle, ETP), respiration, photosynthesis, fermentation, DNA replication, Transcription, translation, gene regulation, Biomolecule separation

Trade test

1. Setting up an autoclave
2. Setting up SDS-PAGE
3. Use of laminar air flows for culturing microbes
4. Protein estimation
5. Buffer preparation
6. Bio-sample preparation for microscopy
7. Thin-layer chromatography
8. Setting up a PCR mix
9. BLAST analysis
10. Nanomaterial characterization using spectroscopy techniques
