



ANDHRA UNIVERSITY

TRANS-DISCIPLINARY RESEARCH HUB

ADVANCED PHARMACEUTICAL BIOTECHNOLOGY

Unit I

Separation of proteins by 2D electrophoresis, Purification of proteins - salting out, precipitation by organic solvents, dialysis, ion-exchange, size exclusion and affinity chromatography methods. Capillary electrophoresis and its applications.

Unit II

Identification of proteins by MALDI-TOF MS, Applications of proteomics - Drug discovery, disease diagnosis, identification and characterization of novel proteins.

Unit III

Bioinformatics: Types of biological data, biological data bases, Nucleic acid and protein sequence data bases. Data base and search engines in proteomics. Protein modeling, Protein & DNA microarrays.

Unit IV

Specific DNA techniques- DNA sequencing, Genome sequencing, DNA hybridization and PCR technology. Theory of lyophilization and its application to biological systems, protein recovery.

Unit V

Nucleic acid technologies - Oligonucleotides, Antisense technology, Aptamer technology, and Ribozymes. Advances in screening - High-throughput screening

Unit VI

Modern vaccine technologies Genetically improved live vaccines, Genetically improved subunit vaccines, synthetic peptide-based vaccines and Nucleic acid vaccines,

Unit VII

Development of Human monoclonal antibodies as therapeutcis Human antibodies derived through Phage-display, Human antibodies from Genetically Engineered Mice and Antibody derivatives.

Unit VIII

Isolation, detection and characterization of viruses. Animal cell cultures, Cell line based evaluation of anticancer agents.



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MODEL QUESTION PAPER

Time: 3 hrs

Max. Marks: 100

Answer any FIVE questions from the following

All questions carry equal marks.

1. Describe in detail about the purification of proteins obtained from microbiological source.
Add note on stability of protein.
2. Write about the following:
 - a) Proteomics and its applications
 - b) Identification of proteins by MALDI TOF-MS
3. Write notes on the following
 - a) Protein sequence data bases
 - b) DNA micro arrays
4. Write in detail about the following.
 - a) DNA sequencing
 - b) Ribozymes
5. Write in detail about the working principle and applications of capillary electrophoresis.
Add note on freeze drying.
6. Describe in detail about genetically improved subunit vaccines and nucleic acid vaccines
7. Discuss about the production of human antibodies derived through phage-display and write a note on high throughput screening.
8. Write in detail about the cell line based evaluation of anticancer agents.