

3 Hours

Total Marks: 100

1. Attempt **all** questions.
2. **All** questions carry **equal** marks.
3. Draw **neat labeled diagrams** wherever necessary.
4. Use of **log tables** and **non-programmable calculator** is **allowed**.

Q.1 a. Do as instructed: (Any six)

06

1. Define pock.
2. What is a Lethal Dose?
3. Give one example of plant disease caused by viroids.
4. State the role of spikes.
5. State true or false: Virus replication inside a cell usually causes death or disease of that cell.
6. Name any one site in an embryonated egg that is used to inoculate viruses.
7. Fill in the blank: Viruses that cannot multiply unless they invade a specific host cell are called as _____.
8. What is nucleocapsid?
9. Give one example of an enzyme used to degrade cellular ribonucleic acids and proteins.

Q.1 b. Give an account of the following: (Any Two)

14

1. General structures of Virus.
2. Cytocidal infection and the mechanisms of host cell damage.
3. Reproduction of dsDNA phages.

Q.2 a. Give one example of each: (Any six)

06

1. Antifungal drug.
2. Aminoglycosides.
3. Broad spectrum antibiotic.
4. Competitive inhibitor.
5. Protein synthesis inhibitors.
6. Quinolones.

7. Narrow spectrum antibiotic.
8. Sulpha Drug.
9. Cell wall synthesis inhibitor.

Q.2 b. Elaborate on the following questions: (Any Two) 14

1. Mode of action of Penicillin and Cephalosporins on bacterial cell wall.
2. Action of Nucleic acid synthesis inhibitors
3. Origin and transmission of drug resistance.

Q.3 a. Attempt the following objectives as directed: (Any six) 06

1. Define Stokes shift.
2. Name the instrument which is used in the study of photosynthesis and respiration in plants.
3. State the role of microspectrofluorimetry.
4. What is intrinsic fluorescence?
5. Fill in the blank: For analysis of drug metabolites, IR is coupled with _____.
6. What is pre-filter absorption?
7. State true or false: The presence of tryptophan and FAD as cofactors allows fluorescence to be measured in proteins.
8. Name the protein used for determining calcium ion concentration by luminometry.
9. Give the full form of FT-IR.

Q.3 b. Answer the following questions: (Any Two) 14

1. Discuss principle and any two applications of Fluorescence spectroscopy.
2. Elaborate on Quasi-elastic light scattering and its applications.
3. Give an account on Instrumentation and applications of Atomic Absorption Spectroscopy.

Q.4 a. Do as directed: (Any Six)

06

1. What is affinity chromatography?
2. State true or false: Calmodulin is a regulatory Ca^{+2} binding proteins is present in all eukaryotic cells is used as ligand for eluting proteins.
3. Fill in the blank: In method validation, precision is expressed in terms of _____. (Mean, Relative standard deviation, regression coefficient)
4. What is a Dead time of a counter?
5. Name any one column used in HPLC.
6. What is method validation?
7. Define linearity.
8. Give any one disadvantage of scintillation counting.
9. What is an autoradiography?

Q.4 b. Discuss the following : (Any Two)

14

1. With reference to Size exclusion chromatography:
 - a. Principle and working.
 - b. Any three applications.
2. With reference to isotopes in biology:
 - a. Nature of radioactivity decay.
 - b. GM counter- construction.
3. With reference to Ion exchange chromatography:
 - a. Principle.
 - b. Anion and Cation exchangers.
 - c. Any two applications.

Q.5 Write Short notes on the following (Any four)

20

- a. Viral Capsid.
- b. Cultivation of bacterial viruses.
- c. Principle of IR.
- d. HPLC – Method Development.
- e. Use and misuse of antimicrobial drugs.
- f. Action of antiviral drugs.