

**BIOPHARMACEUTICALS
(BIOT 6153)**

Time Allotted : 3 hrs

Full Marks : 70

Figures out of the right margin indicate full marks.

Candidates are required to answer Group A and any 5 (five) from Group B to E, taking at least one from each group.

Candidates are required to give answer in their own words as far as practicable.

**Group - A
(Multiple Choice Type Questions)**

1. Choose the correct alternative for the following: **10 × 1 = 10**
- (i) What is preferential route for faster absorption of drugs?
(a) Intravenous (b) Intramuscular
(c) Subcutaneous (d) Intraperitoneal.
- (ii) What are the factors that affect half-life of a drug?
(a) age (b) liver metabolism
(c) both (a) and (b) (d) none of the above.
- (iii) Which is not a characteristic of zero order kinetics?
(a) Rate of elimination is constant.
(b) Rate of elimination is dependant on drug concentration.
(c) Constant amount eliminated per unit time.
(d) All of the above.
- (iv) BCG is used to protect against
(a) Tuberculosis (b) Rabies
(c) Influenza (d) Pertussis.
- (v) One problem associated with the use of modified live vaccine is
(a) toxicity (b) fever
(c) muscle pain (d) residual virulence.
- (vi) A small protein subunit used in a vaccine may fail to stimulate T-cell immunity because of
(a) lack of glycosylation (b) lack of conformation
(c) lack of carrier determinants (d) HLA-related unresponsiveness.

- (vii) Blood clotting process is linked to
(a) Vitamin B12 (b) Vitamin C
(c) Vitamin K (d) Blood pH.
- (viii) Milk intolerance therapy uses
(a) Amylase (b) Glucose oxidase
(c) Proteolytic enzyme (d) Lactase.
- (ix) Pharmacological use of Fluoro carbon is
(a) anti-oxidant (b) blood substitute
(c) anti-allergic (d) none of these.
- (x) DNase is used to control
(a) cystic fibrosis (b) gout
(c) cancer (d) none of these.

Group - B

2. (a) Describe the terms with diagrams of drug-drug interaction of any three of the following:
(i) Cumulative Effect
(ii) Additive Effect
(iii) Synergistic Effect
(iv) Antagonistic Effect
(b) Describe the different steps of drug discovery in detail. **6 + 6 = 12**
3. (a) State the difference between first order elimination and zero order elimination.
(b) Describe the difference between Effective Dose and Lethal Dose and deduce Therapeutic Index. **6 + 6 = 12**

Group - C

4. (a) How interferons are classified into different categories?
(b) Write their mode of action.
(c) Write notes on epidermal and fibroblast growth factor. **2 + 4 + 6 = 12**
5. (a) Briefly describe classification of cytokines on basis of source.

- (b) How cytokine participate in signal transduction pathways?
6 + 6 = 12

Group - D

6. (a) Mention the uses of Tetanus immunoglobulins as biopharmaceuticals.
(b) How can you use dendritic cells as biopharmaceuticals in cancer therapy?
(c) What do you mean by pluripotent and totipotent stem cells? Give examples.
2 + 4 + (4 + 2) = 12

7. (a) What are Peptide vaccines? How are they used as biopharmaceuticals?
(b) Discuss the difficulties with development of AIDS vaccine.
(c) Analyze the rationale behind using HAT medium in Hybridoma technology.
4 + 4 + 4 = 12

Group - E

8. Write short notes on: **4 × 3 = 12**
(i) Function of superoxide dismutase.
(ii) Xanthine oxidase as pharmaceuticals.
(iii) Hemophilia diseases.
9. (a) What are different blood clotting disorder diseases?
(b) Write notes on Thrombopoietin and erythropoietin.
4 + 8 = 12