

**BIOPHARMACEUTICALS
(BIOT 6132)**

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) If an agonist can produce maximal effects and has high efficacy its called
 (a) Partial agonist (b) Antagonist
 (c) Agonist-antagonist (d) Full agonist.
- (ii) In phase II trail, the drug is tested on _____volunteers
 (a) 50-300 (b) 300-600
 (c) 600-900 (d) all of (a), (b) & (c).
- (iii) Which of the following factors will affect the solubility of drugs?
 (a) Polarity (b) Molecular size
 (b) Polymorphs (d) All of (a), (b) & (c).
- (iv) The technology used to speed up the testing of compounds from various sources is _____
 (a) pharmcogenomics (b) high throughput screening
 (c) clinical trials (d) pharmcoproteomics.
- (v) Which of the following are potential therapeutic uses of embryonic stem cells?
 (a) Regenerate cells of the immune system
 (b) Replace neurons after an accident
 (c) Repair damage to heart muscle after a heart attack
 (d) All of the above.
- (vi) Plasmids encoding antigenic protein from a pathogen directly injected into cells where its express constitute
 (a) Protein vaccine (b) Nucleotide vaccine
 (c) DNA vaccine (d) Recombined vaccine.

- (vii) Which of the therapeutic products are approved in India?
 (a) HepatitisB vaccine (b) Human Insulin
 (c) Streptokinase (d) All of these.
- (viii) Cachectin is another name of
 (a) TNF-alpha (b) TNF-beta
 (c) TGF-beta (d) Interleukins.
- (ix) The gene for IFN gamma is located on human chromosome
 (a) Nine (b) Thirteen (c) Twelve (d) Seven.
- (x) Blood clotting process is linked to
 (a) Calcium (b) Magnesium
 (c) Manganese (d) None of these.

Group – B

2. (a) What is a Drug Receptor? Explain the presence of spare receptors.
 (b) Analyse with the help of a schematic diagram the relative potency of various drugs.
 (c) Explain with the help of a diagram the effectiveness, toxicity and lethality of different drugs. **(2 + 2) + 4 + 4 = 12**
3. (a) What is bioavailability? Explain with the help of a diagram how bioavailability can be determined.
 (b) Explain the structure of antibody with a diagram giving emphasis on formation/breakdown of disulfide bonds. **(2 + 4) + 6 = 12**

Group – C

4. (a) Define cytokine. Classify cytokine on the basis of their function.
 (b) Explain the effect of inhibitors on JAK-STAT pathway.
 (c) What is additional interferon? **(2 + 4) + 4 + 2 = 12**
5. (a) What are different kinds of cytokine receptors?
 (b) Write a short note note on TNF.
 (c) What is the function of Roferon and Ribovirin. **6 + 4 + 2 = 12**

Group - D

6. (a) Describe the hybridoma technology for producing monoclonal antibodies.
(b) Mention the applications of monoclonal antibodies in cancer therapy.
(c) What are the advantages of polyclonal antibodies?

4 + 4 + 4 = 12

7. (a) How are anti-D immunoglobulins used as biopharmaceuticals?
(b) What is a conjugated peptide vaccine?
(c) How can you prepare a DNA vaccine?

4 + 4 + 4 = 12

Group - E

8. (a) What do you mean by blood substitutes? Shortly describe different types of blood substitutes.
(b) Shortly describe blood coagulation process.

6 + 6 = 12

9. (a) What is Haemostasis?
(b) What is G-CSF?
(c) What are different factors related to blood coagulation process.

3 + 3 + 6 = 12