

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) Following are the phase 1 reactions except
(a) Oxidative reactions (b) Hydrolytic reactions
(c) Reductive reactions (d) Sulphide reaction
- (ii) First pass metabolism occurs in
(a) Liver (b) Kidneys
(c) Pancreas (d) Intestines
- (iii) The virus used as a vector in gene therapy include
(a) oncoretrovirus (b) adenovirus
(c) herpes virus (d) all of the above
- (iv) Embryonic stem cells are
(a) Multipotent (b) Pleuripotent
(c) Totipotent (d) Unipotent
- (v) If an agonist can produce maximal effects and has high efficacy it's called
(a) Partial agonists (b) Antagonists
(c) Full agonists (d) Agonist-antagonist
- (vi) IL-2 is produced by
(a) B cells (b) Th 1 cells
(c) Macrophages N (d) one of these
- (vii) IL-10 acts to
(a) enhance T cell responses (b) inhibit macrophage activation
(c) suppress cytokine production (d) suppress antibody production
- (viii) Hemophilia A is due to deficiency of clotting of clotting factor
(a) X (b) XIII
(c) XII (d) V

- (ix) Plasmids encoding antigenic protein that is directly injected into the cells where it can express constitute
- | | |
|----------------------|--------------------------|
| (a) Protein vaccines | (b) Nucleotide vaccines |
| (c) DNA vaccines | (d) Recombinant vaccines |
- (x) Embryonic stem cells are derived from _____ of the blastocyst
- | | |
|---------------------|--------------|
| (a) Inner cell mass | (b) Ectoderm |
| (c) Blastocoel | (d) Mesoderm |

Group- B

2. (a) Distinguish between pre-clinical and clinical trials. [(CO1)(Compare/IOCQ)]
(b) What is pKa? Determine the reasons by which pka can be used as a criterion for drug absorption. (CO1)(Evaluate/HOCQ)]
(c) Draw a conclusion between first order and zero order elimination of drug. Which one is better? [(CO1)(Apply/IOCQ)]
- 4 + (2 + 2) + (2 + 2) = 12**
3. (a) Using the standard definition of a drug, define new drug. [(CO1)(Analyze/IOCQ)]
(b) What is a drug substance and what is API composed of? [(CO1)(Remember/LOCQ)]
(c) Discuss in detail the steps of drug discovery. [(CO1)(Evaluate/HOCQ)]
- 4 + 4 + 4 = 12**

Group - C

4. (a) Define cytokine. Classify cytokine on the basis of their function. [(CO2) (Classify/IOCQ)]
(b) What is additional interferon? [(CO2) (Remember/LOCQ)]
(c) Give a brief criticism on the effect of inhibitors on JAK-STAT pathway. [(CO2)(Criticize/HOCQ)]
- (2 + 4) + 2 + 4 = 12**
5. (a) What are different kinds of cytokine receptors? [(CO2) (Remember/LOCQ)]
(b) Evaluate the importance of TNF in the human immune system. [(CO2) (Evaluate/HOCQ)]
(c) Compare the functions of Roferon and Ribovirin. [(CO2)(Compare/IOCQ)]
- 4 + 4 + 4 = 12**

Group - D

6. (a) Cite one example of Interleukin-based cancer immunotherapy. [(CO5) (Remember/LOCQ)]

- (b) What do you mean by a peptide vaccine? Discuss the advantages of a DNA vaccine. [(CO3,6) (Analyze/IOCQ)]
- (c) What are Abzymes? Comment on the applications of MAbs in cancer therapy. [(CO4)(Analyze/IOCQ)]
 $4 + (2 + 2) + (1 + 3) = 12$
7. (a) Define: Totipotency, Pleuripotency, Multipotency. [(CO4) (Understand/LOCQ)]
- (b) Analyze with reasons why cord blood stem cells so valuable for research. [(CO4) (Analyze/IOCQ)]
- (c) Present a scientific criticism on use of adult stem cells in cancer therapy. [(CO4)(Critcize/HOCQ)]
 $3 + 4 + 5 = 12$

Group - E

8. (a) What do you mean by blood substitutes? Shortly describe different types of blood substitutes. [(CO5) (Remember/LOCQ)]
- (b) What is Haemostasis? [(CO4)(Remember/LOCQ)]
- (c) Discuss and analyze the blood coagulation process. [(CO5) (Analyze/IOCQ)]
 $(3 + 3) + 3 + 3 = 12$
9. (a) Give a illustrative account of different blood clotting disorder diseases. [(CO5) (Remember/LOCQ)]
- (b) Criticize the roles of Thrombopoetin and erythropoietin. [(CO5) (Critcize/HOCQ)]
 $6 + (3 + 3) = 12$

Cognition Level	LOCQ	IOCQ	HOCQ
Percentage distribution	31%	48%	21%

Course Outcome (CO):

After completion of this course, the students should be able to:

- 1) Understand the concept behind drug discovery and development along with their Pharmacokinetics and Pharmacodynamics knowledge.
- 2) Analyze the course of actions of various cytokines and their applications in therapeutics.
- 3) Describe the uses of various types of vaccines.
- 4) Understand and analyze the uses of various kinds of enzymes for their therapeutic values.
- 5) Explain the usage of interleukins and growth factors as biopharmaceuticals.
- 6) Apply the rationale behind use of peptide vaccines and its application against infectious diseases.

M.TECH/BT/3RD SEM/BIOT 6132/2021

*LOCQ: Lower Order Cognitive Question; IOCQ: Intermediate Order Cognitive Question;
HOCQ: Higher Order Cognitive Question

Department & Section	Submission Link
BT	https://classroom.google.com/c/NDIzNjY2ODA5MDcw/a/NDY0MTM5NzM2NDk0/details