CS/B.TECH(BT)/SEM-8/BT-802/09

1. .....
Signature of Invigilator

2. .....
Signature of the Officer-in-Charge

Reg. No. | | | | | | | | | | | | | | |

Roll No. of the Candidate | | | | | | | | | | | | | | |

CS/B.TECH(BT)/SEM-8/BT-802/09

ENGINEERING & MANAGEMENT EXAMINATIONS, APRIL – 2009

MEDICAL AND PHARMACEUTICAL BIOTECHNOLOGY (SEMESTER - 8)

Time : 3 Hours] [Full Marks : 70

INSTRUCTIONS TO THE CANDIDATES :

1. This Booklet is a Question-cum-Answer Booklet. The Booklet consists of **32 pages**. The questions of this concerned subject commence from Page No. 3.
2. a) In **Group – A**, Questions are of Multiple Choice type. You have to write the correct choice in the box provided **against each question**.
   b) For **Groups – B** & **C** you have to answer the questions in the space provided marked 'Answer Sheet'. Questions of **Group – B** are Short answer type. Questions of **Group – C** are Long answer type. Write on both sides of the paper.
3. **Fill in your Roll No. in the box** provided as in your Admit Card before answering the questions.
4. Read the instructions given inside carefully before answering.
5. You should not forget to write the corresponding question numbers while answering.
6. Do not write your name or put any special mark in the booklet that may disclose your identity, which will render you liable to disqualification. Any candidate found copying will be subject to Disciplinary Action under the relevant rules.
7. **Use of Mobile Phone and Programmable Calculator is totally prohibited in the examination hall.**
8. You should return the booklet to the invigilator at the end of the examination and should not take any page of this booklet with you outside the examination hall, **which will lead to disqualification**.
9. Rough work, if necessary is to be done in this booklet only and cross it through.

No additional sheets are to be used and no loose paper will be provided

FOR OFFICE USE / EVALUATION ONLY

Marks Obtained

	Group – A										Group – B			Group – C				
Question Number																	***Total Marks***	***Examiner's Signature***
Marks Obtained																		

.....
Head-Examiner/Co-Ordinator/Scrutineer

8828 (21/04)

DO NOT WRITE ON THIS PAGE

ENGINEERING & MANAGEMENT EXAMINATIONS, APRIL – 2009

MEDICAL AND PHARMACEUTICAL BIOTECHNOLOGY

SEMESTER - 8

Time : 3 Hours] [Full Marks : 70

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternative for any *ten* of the following : 10 × 1 = 10

i) DNA vaccine can elicit

a) cell mediated immunity

b) humoral immunity

c) both cell mediated & humoral immunities

d) none of these. ☐

ii) Elevated LDH-1/LDH-2 is observed in

a) Bone cancer b) Heart disease

c) Liver failure d) Lung infection. ☐

iii) Phospholipids are important cell membrane constituents because they

a) can form liposomes with water

b) contain both polar & nonpolar portions

c) combine covalently with proteins

d) all of these. ☐

iv) Adenovirus contains

a) double stranded DNA b) single stranded DNA

c) single stranded RNA d) none of these. ☐

v) Liposome is a mixture of

a) lipid in aqueous medium

b) protein in aqueous medium

c) carbohydrate in aqueous medium

d) all of these. ☐

vi) An example of a polyketide is

a) erythromycin b) taurocholic acid

c) levo cetrizine d) none of these. ☐

vii) A tetradoma is

a) a fusion of two hybridoma cells

b) a fusion of an antibody secreting cell and a hybridoma cell

c) all of these

d) none of these. ☐

viii) $H_2 SO_4$ can be used in ELISA to

a) intensify the colour generated

b) stop the enzyme-induced colour generation

c) decrease non-specific colour generation (noise) by the ELISA plate

d) none of these. ☐

ix) For conversion of triglyceride to glycerol, which one of the following enzymes is required ?

a) Lipase b) Uricase

c) Luciferase d) Cholesterol oxidase. ☐

x) Which one of the following prompts interferon beta to be secreted ?

a) ssDNA b) dsRNA

c) ssRNA d) dsDNA. ☐

xi) IFN is produced from

a) virally infected cells b) macrophages

c) dendritic cells d) RBCs. ☐

xii) The gene knocked out in monoclonal antibody is

a) G6PD b) HGPRT

c) Insulin d) Dystrophin. ☐

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

2. Briefly describe the microbial transformation of steroid. 5

3. What is interferon ? Systematically explain the production of recombinant interferon. $2 + 3$

4. Write short notes on any *two* of the following : $2 \times 2\frac{1}{2}$

   a) DNA vaccine

   b) Nanoparticle mediated biosensors

   c) Ligand screening.

5. Why is ionization essential to study biomolecules through Mass Spectrometry ? What is mass spectrum ? $2 + 3$

6. Mention different approaches for recombinant insulin production. Compare recombinant insulin from its native human insulin form. Name two commercial insulins. $2 + 2 + 1$

GROUP – C

(Long Answer Type Questions)

Answer any *three* questions. $3 \times 15 = 45$

7. What are 'Seeded micro-crystalline film', 'Slow crystallization' and 'Thin layer' methods for sample preparation in proteomic study ? Why is it difficult to produce human monoclonal antibodies by conventional hybridoma technology ? Name the different viral routes of gene therapy. What is a 'Toxblot' ? $(3 \times 2) + 3 + 4 + 2$

8. What is a 'Biochip' ? Explain with suitable schematic diagram, how the DNA micro-array functions. What are the goals of toxicogenomic study ? What are selectable biomarkers ? What is GFP ? $2 + 5 + 5 + 2 + 1$

9. What is toxicogenomics ? Explain with a neat diagram, the main components of a biosensor and their functions. Why are blocking agents used in an ELISA ? What is 'HAC' ? What are its uses ? How can you design an optical biosensor utilizing enzyme from firefly ? $2 + 5 + 2 + 1 + 1 + 4$

10. Define gene therapy and its types. Name the vectors used in gene therapy. What are the modifications made in retrovirus to be used as a vector in gene therapy ? How can infectious HIV be prevented from multiplication inside the humans by gene therapy techniques ? 3 + 2 + 4 + 6

11. What is biosensor ? Mention its application. What are enzyme based and non-enzyme based biosensors ? Cite two examples for each type. Describe systematically the immunological assays for HIV. 2 + 3 + 4 + 6

END