UG/II/BIOT/H/III/17(New)

2017

BIOTECHNOLOGY

[Honours]

PAPER – III

Full Marks : 90

Time : 4 hours

The figures in the right hand margin indicate marks

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

Illustrate the answers wherever necessary

[NEW SYLLABUS]

GROUP – A

(*Genetic Engineering*)

[*Marks* : 30]

Answer any **two** of the following : 15×2

1. (*a*) Briefly explain the technique of oligo-nucleotide directed mutagenesis. How PCR technique is used in site directed Mutagenesis ?

   (*b*) Distinguish between RFLP and RAPD.

   (*c*) Discuss the methods of preparation of genomic DNA library and its application in Gene mapping. $(4 + 3) + 4 + 4$

2. (*a*) What are the features of the Ti-plasmid ?

   (*b*) Describe the process of T-DNA transfer and integration in plant genome.

   (*c*) What are Co-integrated and Binary vectors ?

   (*d*) What is the role of PEG in gene transfer ? $2 + 6 + 4 + 3$

3. (*a*) Briefly describe the method of DNA footprinting.

   (*b*) What is gene targeting ? Discuss in detail the methods used for gene targeting.

(*c*) Distinguished betwen Dot blot and Slot blot analysis.

(*d*) State the strategy which is used to select only the growth of mutants. 5 + (2 + 3) + 3 + 2

4. Write short notes on the following : 5 + 5 + 5

(*i*) Shotgun method

(*ii*) Dolly, the cloned sheep

(*iii*) Knockout mice.

GROUP – B

(*Immunology*)

[*Marks* : 30]

Answer any **three** questions from the following : 10 × 3

5. (*a*) What are antigenic drift and antigenic shift ?

(*b*) Give one example of one disease where antigenic shift and drift is possible.

(*c*) What are the forces involved in Antigen antibody reaction ? 2 + 2 + 6

6. (*a*) Distinguish between Allotype and Isotype with example.

   (*b*) Explain different types of vaccine with examples. 3 + 7

7. (*a*) Give the molecular mechanism of transplant rejection. How transplant rejection can be avoided ?

   (*b*) What is allograft ?

   (*c*) What do you mean by memory cells ?

   (*d*) Differentiate between Helper T-cell and Cytotoxic T-cells. 3 + 3+ 2 + 2

8. (*a*) Distinguish between structural features of MHC-I and MHC-II molecules.

   (*b*) Discuss the role of recombination signal sequences in VDJ joining during Somatic hypermutation. Discuss the importance of HAT medium in selection of monoclonal antibody. 3 + (5 + 2)

9. (*a*) Discuss the methods of classical pathway of complement activation.

(*b*) Write the principle of RIA.

(*c*) What is meant by Immunogen and Hapten ? 4 + 3 + 3

GROUP – C

(*Animal Cell Culture*)

[*Marks* : 30]

Answer any **six** questions from the following : 5 × 6

10. Write the physical methods of transfection in animal cell. 5

11. Describe the Physicochemical property and composition of complete medium. 5

12. What is Feeder layer and plating efficiency ? 2 + 3

13. Describe the advantages and disadvantage of serum containing medium. 3 + 2

14. *Describe the* importance of routine maintenance in Animal Cell Culture. 5

15. What is antigenic marker of cancer cell ? Give an example. Why cancer cells show immortality ? (2 + 1) + 2

16. Distinguish between cell differentiation and cell proliferation. Describe the role of Inducer in cell differentiation. 3 + 2

17. What is Subculture ? Differentiate between anchorage dependent and anchorage independent cell culture. 2 + 3

18. What is Fate map ? Write the application of FACS in diseases detection. 2 + 3