2022

BIOTECHNOLOGY

(Theory)

Full Marks : 70

Pass Marks : 21

Time : Three hours

All the questions are compulsory.

The figures in the right margin indicate full marks for the questions.

*Question Nos. **1 to 4** are of objective type questions carrying 1 mark each, select the most appropriate one from the given alternatives A, B, C and D and rewrite the same.*

1. The protein structure in which the linear sequence of covalently linked amino acids sequence is defined as – 1

   (A) primary structure

   (B) secondary structure

   (C) tertiary structure

   (D) quarternary structure

2 Who invented polymerase chain reaction process ? 1

   (A) Edward Southern

   (B) Andrew Caulson

   (C) Walter Gilbert

   (D) Karry Mullis

3 The microbial species used in the commercial production of ethanol is – 1

(A) Aspergillus niger

(B) Aspergillus oryzae

(C) Saccharomyces cerevisiae

(D) Escherichia coli

4 Erzthropoietin produced by using animal cell culture and r DNA technology is used in the treatment of – 1

(A) Infertility

(B) Anaemia

(C) Haemophilia A

(D) Haemophilia B

Question Nos. ***5 to 14*** *are very short answer type questions carrying* ***1*** *mark each.*

5. Define the importance of Van der Waals forces. 1

6. What are plasmids ? 1

7. Write the full form of NCBI. 1

8. How ionic bends differ from hydrogen bonds ? 1

9. Explain the importance of microarray technology in biotechnology. 1

10. Give one point of difference between Genomic DNA and Organelle DNA. 1

11. How continuous culture is more preferable in getting a continuous supply of microbial products ? 1

12. In what way temperature plays a great role in animal cell culture? 1

13. Explain why restriction enzymes are known as molecular scissors? 1

14. Give one point of difference between Finite and Continuous cell lines. 1

Question Nos. ***15 to 24*** *are short answer type-II questions carrying 2 marks each.*

15. Describe the two types of DNA Library. 2

16. Explain the two techniques used to determine the three dimensional structure of proteins 2

17. Identify the main branches of genomics. 2

18. In what way you can identify a sequence as a DNA sequence or an RNA sequence? 2

19. Illustrate two advantages of bioreactors. 2

20. Detect two limitations of animal cell culture. 2

21. "A number of human diseases are due to the deficiency of abnormal structure of proteins". Justify the statement by giving two examples. 2

22. Why are m RNAs not directly cloned? 2

23. "The biotechnological methods of germplasm conservation can supress many problems created by conventional methods". Analyse the Statement. 2

24. Explain why the two types of mammalian stem cells are useful in many medical conditions where cells are either dead or injured or abnormal? 2

Question Nos. ***25 to 31*** *are short answer type-I questions carrying 3 marks each.*

25. Distinguish the three types of proteomics. 3

26. Identify three features posses by a cloning vector. 3

27. How trangenic plants are beneficial against the diseases caused by micro-organims and pest ? 3

28. Illustrate three scale-up methods of animal cell culture. 3

29. Single-gene mutation follows Mendelian inheritance. Analyse by giving three reasons. 3

30. In all biotechnological processes biosafety issues is of paramount importance. Justify the statement in three points. 3

31. Draw a typical bacterial growth curve and label Stationary phase and Death phase. 3

*Question Nos. **32** to **34** are of Long answer type questions and carry **5** marks each.*

32. Describe five properties of DNA polymerases. 5

33. Explain five types of plant cell and tissue culture. 5

34. Explain why efforts should be made to maximise protein stability during various steps of effective separation of cellular debries from soluble proteins. Analyse the various steps. 5