CBSE Class 12 Biotechnology 2016 - Set 99/1

Question Paper

Conducted by the Central Board of Secondary Education (CBSE)

Time Allowed: 3 Hours **Maximum Marks: 70**

General Instructions

(i) All questions are compulsory.

(ii) There is no overall choice. However, an internal choice has been provided in one question of three marks and one question of five marks. You have to attempt only one of the choices in such questions. Questions paper contains four sections A, B, C and D.

(iii) Questions number 1 to 6 are very short answer questions, carrying 1 mark each.

(iv) Questions number 7 to 14 are short answer questions, carrying 2 marks each.

(v) Questions number 15 to 25 are also short answer questions, carrying 3 marks each.

(vi) Question numbers 26 to 28 are long answer questions, carrying 5 marks each.

(vii) Use of calculators is not permitted. However, you may use log tables, if necessary.

Section A

1. Name two secondary metabolites produced through plant cell culture.

2. What is Herceptin ?

3. A lab technician obtained a lyophilised culture of a bacterium. Which technique should be used to find whether culture is viable or not ?

4. In a PCR reaction, following components were taken; Double stranded DNA, Taq polymerase, dNTPs and double stranded primer. But even after 30 cycles, no amplification of the target DNA could be seen. Why ?

5. What is the relationship between the specific activity and purity of a protein ?

6. Different types of vectors are needed in recombinant DNA technology. Why ?

Section B

7. Administration of monoclonal antibodies against CD3 can help accept renal allograft in patients. Why ?

8. Mention two problems which make the downstream processing of recombinant proteins difficult and costly.

9. Enlist two reasons justifying the need and usefulness of obtaining complete sequence of genomes.

10. Plot a graph of the variation of cell density [X], concentration of substrate [S] and cell-specific substrate turnover rate [QS] Vs time for a batch culture.

11. Why is it difficult to culture animal cells as compared to plant cells ? Antibiotics are added to culture medium for animal cells. Why ?

12. As a biotechnologist, what strategy will you suggest to your friend to enhance microbial growth, while culturing microbes in the laboratory in a 500 ml conical flask ?

13. While growing animal cells in culture, why is osmolality of culture medium significant ?

14. Differentiate between genomic and c-DNA library.

Section C

15. Name the property of plant cells that enables it to give rise to a complete plant using tissue culture. Suggest any two applications of plant tissue culture.

16. What is vector ? Enumerate four important features of a DNA molecule enabling it to act as vector.

17. Indicate the use of the following in microbial cell culture: (a) Liquid nitrogen (b) Agar (c) Nitrosoguanidine (d) Glycerol What is the function of culture collection centres ?

18. (a) Differentiate between anchorage-dependent and anchorage-independent cells. (b) How is damage to cells prevented during cryopreservation ?

19. What is Molecular Pharming ? List any four advantages of expressing transgenic proteins in milk.

20. What are epitopes ? Why recombinant vaccines based on selected epitopes are better than conventional vaccines ?

21. Describe aqueous two-phase partition process for separation of proteins.

OR

21. Describe a technique to detect and confirm Sickle cell anaemia.

22. What are primary and secondary metabolites ? What role do secondary metabolites play in plants ?

23. Describe any three vectorless gene transfer methods used for plant cell transformation.

24. The publication of 'Atlas of Protein Sequence and Structure' under the editorship of Margaret O. Dayhoff was a pioneering effort. Why ?

25. With an example, illustrate (a) a blunt end cutter restriction enzyme. (b) a sticky end cutter restriction enzyme. Which type of ends are better and why ?

Section D

26. What is meant by the Biological value of proteins ? How do Branched Chain Amino Acids (BCAA) help athletes to protect their muscle mass and improve their performance ?

OR

26. What physical and chemical properties of naturally occurring enzymes might be useful to change by 'site-directed mutagenesis' ? Explain with an example, how site directed mutagenesis has helped to make enzyme use possible in detergents.

27. Explain with suitable diagram, the principle and steps involved in Sanger's method of DNA sequencing.

28. What is meant by Proteomics ? Explain three types of proteomics. Why proteome of a given species is larger than its genome ?

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