S.NO: 6082 P 22 BCCC 1 B

(For candidates admitted from 2022 - 2023 onwards)

M.Sc. DEGREE EXAMINATION, NOVEMBER 2023.

Biochemistry - Core Choice Course

BIOTECHNOLOGY AND GENETIC ENGINEERING

Time: 3 Hours **Maximum Marks : 75**

SECTION – A (20 Marks)

Answer ALL Questions

I. a. Multiple choice questions (5 x 1 = 5)

1. Which of the following vector can carry the longest piece of a gene of interest?
   a) Plasmid b) BAC c) YAC d) Cosmids
2. Which is used for the introduction of alien DNA into animal cells?
   a) Retroviruses b) Agrobacterium tumifaciens c) Biolistics d) Microinjection
3. Genome-wise gene expression analysis is performed using
   a) Northern analysis b) Real-time PCR c) RT PCR d) DNA microarrays
4. Stem cells are derived from which of the following?
   a) Tropoblast b) Inner cell mass c) Blastomere d) Morula
5. GEAC stands for
   a) Genetic Ethical Approval Committee b) Genetic Engineering Approval Committee
   c) Genetic Engineering Active Community d) Gene Expressing Active component

b. Fill in the blanks (5 x 1 = 5)

6. Antibiotic resistance gene present in pBR322_____.
7. _____ is the process of removing contaminants from the surface of an explant in PTC.
8. RFLP is used to identify a _____.
9. ADA deficiency requiresa periodic infusion of _____.
10. IPR stands for _____

II. Answer ALL the Questions: (5 x 2 = 10)

11. Give an example of a restriction enzyme with its restriction sequence.
12. What is the role of hypochlorite in explant sterilization?
13. What is the Ames test?
14. What is the principle of Aptamers? Mention any two applications.
15. Enlist any two benefits and risks of GMOs.

SECTION – B (5 X 5=25 marks)

Answer ALL the Questions, Choosing either (a) or (b)

16. (a) Write a short note on the unique properties of pBR322 that make them suitable as vectors. (Or)
    (b) Write in brief about Blue – White screening.
17. (a) Explain the use of agrobacterium for genetic engineering in plants. (Or)
    (b) Explain in detail about protoplast isolation.
18. (a) Describe the methodof RAPD analysis. (Or)
    (b) Explain chromosome walking.
19. (a) Write a short note on the role of ribozymes in gene therapy. (Or)
    (b) How stem cells are used putatively in cell-based gene therapies?
20. (a) Briefly explain the role of gene banks. (Or)
    (b) Discuss types of biosafety with their advantages and disadvantages.

SECTION – C (3 x 10= 30)

Answer any THREE Questions

21. Discuss in detail YACs.
22. Discuss the various stages of Micropropagation with its applications.
23. Summarize how is DNA sequenced by the chain termination method, how it differs from the chemical degradation method?
24. Explain the strategy involved in Antisense therapy with its role in gene therapy.
25. Explain in detail about Human genome projects.

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