

(7 pages)

Reg. No. :

Code No. : 30425 E Sub. Code : AAMI 41

B.Sc. (CBCS) DEGREE EXAMINATION,
NOVEMBER 2022.

Fourth Semester

Microbiology – Allied

GENETIC ENGINEERING

(For those who joined in July 2020 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer:

1. If blunt ended ligations are to be carried out. Which of the following enzymes can be used?
 - (a) E. Coli DNA ligase
 - (b) T4 DNA ligase
 - (c) Both of these enzymes act equally in carrying out blunt ended ligations
 - (d) None of them is able to carry out blunt ended ligations

2. Which one of the enzyme used to remove phosphate group from the 5' end of the DNA?
 - (a) Alkaline phosphatase
 - (b) Phytase
 - (c) Poly nucleotide kinase
 - (d) Ribonuclease H
3. Restriction enzymes are also called as
 - (a) Molecular scissors
 - (b) Molecular knives
 - (c) Molecular scalpels
 - (d) All of these
4. Single stranded unpaired extensions formed by restriction enzyme upon cleavage is called as
 - (a) Blunt ends
 - (b) Sticky ends
 - (c) Flush ends
 - (d) None of these
5. Which among the following are the smallest plasmid and an ideal cloning vector?
 - (a) ColE1
 - (b) RP4
 - (c) PUC18
 - (d) F

6. Size of PBR322 is _____.
- (a) 100 kb (b) 10 kb
(c) 4.3 kb (d) 1 kb
7. It is required to distinguish between the cells that have taken up the vector and that have not. It is done by using _____.
- (a) multiple cloning site
(b) origin of replication
(c) high copy number
(d) selectable marker
8. Direct DNA uptake by protoplasts can be stimulated by
- (a) Polyethylene glycol (PEG)
(b) Decanal
(c) Luciferin
(d) All of these
9. From a single molecule of DNA, PCR can make
- (a) one additional copy
(b) hundreds of copies
(c) thousands of copies
(d) millions of copies

10. Which of the following is incorrect about a microarray?
- (a) It is a slide attached with a high-density array of immobilized DNA oligomers representing the entire genome of the species under study
(b) Array of immobilized DNA oligomers cannot be cDNAs
(c) Each oligomer is spotted on the slide and serves as a probe for binding to a unique complementary cDNA
(d) It is the most commonly used global gene expression profiling method

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) Write notes on DNA modifying enzymes.
Or
(b) Briefly explain the choice of vectors for fungi?

12. (a) Briefly explain the terms of adapter and linkers in vector construction.

Or

- (b) Write notes on:

- (i) Bam H1
- (ii) EcoR1.

13. (a) What is pBR322? How was it constructed?

Or

- (b) Briefly explain about cosmid vectors.

14. (a) Explain the gene transfer technique of electroporation.

Or

- (b) Briefly explain the process of insertional inactivation.

15. (a) Describe the method of direct DNA transfer.

Or

- (b) Briefly explain the recombinant screening method of blue-white selection.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Define cloning vectors? Briefly explain the fungal cloning vectors.

Or

- (b) Discuss about plant and mammalian cell vectors.

17. (a) Write notes on:

- (i) Adapter and linker
- (ii) Blunt and cohesive ends

Or

- (b) Describe about enzymes involved in genetic engineering.

18. (a) Write notes on Lambdaphage derived vectors.

Or

- (b) Discuss about hybrid vectors.

19. (a) Describe the methods of gene transfer.

Or

(b) Discuss about the methods of screening of recombinants.

20. (a) Write notes on cDNA library. Explain its procedure.

Or

(b) Write down the application of PCR in biotechnology and genetic engineering.
