

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)
BSc DEGREE EXAMINATION DECEMBER 2022
(Fifth Semester)
Branch – MICROBIOLOGY

**PRINCIPLES OF GENETIC ENGINEERING AND RECOMBINANT DNA
TECHNOLOGY**

Time: Three Hours

Maximum: 75 Marks

SECTION-A (10 Marks)

Answer ALL questions

ALL questions carry EQUAL marks

(10 x 1 = 10)

- 1 The other name of restriction enzymes
 - (i) Molecular scissors
 - (ii) Molecular knives
 - (iii) Molecular scalpels
 - (iv) All of these
- 2 The two exonuclease activities of DNA polymerase I
 - (i) Degrade DNA in a 5' to 3' direction
 - (ii) Degrade DNA in a 3' to 5' direction
 - (iii) Occur at two different active sites
 - (iv) Are coupled gapped DNA
- 3 P1 cloning vector is the example of
 - (i) Cosmid
 - (ii) Plasmid
 - (iii) Phagemid
 - (iv) Bacteriophage
- 4 Cosmid vectors are
 - (i) Cryptic plasmids
 - (ii) Plasmids that contain fragment of λ DNA including the cos site
 - (iii) Phages that lack cos site
 - (iv) Plasmids without selection marker
- 5 In _____ organisms, the gene is noted into model organisms
 - (i) Prokaryotic
 - (ii) Eukaryotic
 - (iii) Both A and B
 - (iv) None
- 6 The DNA can be denatured by
 - (i) Normal condition
 - (ii) Rising temperature
 - (iii) Ligation
 - (iv) All of these
- 7 Primer used for the process of PCR
 - (i) Double stranded DNA
 - (ii) Single stranded DNA
 - (iii) Double stranded RNA
 - (iv) Single stranded RNA
- 8 RAPD
 - (i) Random Amplified Polymorphic DNA
 - (ii) Rectified Amplified Polymorphic DNA
 - (iii) Reverse Amplified Polymorphic DNA
 - (iv) Ready Amplified Polymorphic DNA
- 9 The following is called as deoxynucleotide chain termination methods
 - (i) Maxam-Gilbert method
 - (ii) B. Sanger's method
 - (iii) Edman method
 - (iv) Automated method
- 10 Which of these is important for preparing templates for Next Generation Sequencing?
 - (i) Breaking DNA up into smaller fragments
 - (ii) Isolating DNA from tissue
 - (iii) Checking the quality and quantity of the fragment library
 - (iv) All of these

Cont...

SECTION - B (35 Marks)Answer **ALL** Questions**ALL** Questions Carry **EQUAL** Marks

(5 x 7 = 35)

11 a Explain what does DNA ligases do?

OR

b Bring out the different types of nucleases and how do they function?

12 a How will the baculovirus vector can be developed.

OR

b Describe the importance of expression vector.

13 a Summarize the construction of cDNA library.

OR

b What are immunological methods? Explain it.

14 a List the applications of southern blotting.

OR

b Explain the principles of RFLP.

15 a State the application of Sanger sequencing.

OR

b Outline the four steps of next-generation sequencing.

SECTION - C (30 Marks)Answer any **THREE** Questions**ALL** Questions Carry **EQUAL** Marks

(3 x 10 = 30)

16 Clasify the different kinds of DNA polymerase with its applications.

17 Highlight how to introduce recombinant DNA into a cell?

18 Elucidate the Maniatiss' strategy for producing representative genomic library.

19 Dicuss in detail about he principles and application of polymerase chain reaction.

20 Enumerate the principles of Maxim and Gillbert's method with its importance.

Z-Z-Z

END