

PSG COLLEGE OF ARTS & SCIENCE  
(AUTONOMOUS)

MSc DEGREE EXAMINATION DECEMBER 2022  
(Second Semester)

Branch – BIOTECHNOLOGY

RECOMBINANT DNA TECHNOLOGY

Time: Three Hours

Maximum: 50 Marks

SECTION-A (5 Marks)

Answer ALL questions

ALL questions carry EQUAL marks (5 x 1 = 5)

- 1 Selective degradation of single stranded DNA is carried out by ----- enzyme.  
(i) S<sub>1</sub> nuclease (ii) Ribonuclease  
(iii) Nuclease (iv) Deoxy ribonuclease
- 2 The vectors commonly used for sequencing human genome  
(i) PAC (ii) Plasmid  
(iii) M<sub>13</sub> (iv) YAC
- 3 Expression vectors differ from a cloning vector in having  
(i) An origin of replication (ii) Suitable marker genes  
(iii) Control elements (iv) Unique restriction sites
- 4 A reaction mixture for PCR consists of -----  
(i) Heat unstable polymerase  
(ii) Primers in a limited amount  
(iii) Deoxynucleoside triphosphate  
(iv) A region complementary to the sequence to be amplified
- 5 ----- option most closely relates to how CRISPR-Cas9 works.  
(i) Measure and cut (ii) Cut and paste  
(iii) Seek and destroy (iv) Trash and burn

SECTION - B (15 Marks)

Answer ALL Questions

ALL Questions Carry EQUAL Marks (5 x 3 = 15)

- 6 a What is the basic feature of the host control restriction found in bacteria?  
OR  
b Discuss the uses of linkers in DNA cloning technology.
- 7 a Explain the basic features of phagemids.  
OR  
b Explain how pBR322 is used for a cloned DNA fragment.
- 8 a Write short note on the characteristic features of bacteriophage Lambda vector.  
OR  
b Write a detailed account on tissue specific vectors.
- 9 a Explain the principle and applications of slab gel-based electrophoresis.  
OR  
b Discuss any two methods of non-radioactive labeling methods.
- 10 a Explain the basic steps involved in selection of mutant *E.coli* strains for SDM through uracil replacement.  
OR  
b Write briefly on ligase chain reaction.

Cont...

**SECTION -C (30 Marks)**

Answer ALL questions

ALL questions carry EQUAL Marks

(5 x 6 = 30)

11 a Discuss the mode of action of different types of restriction enzymes in cleaving the DNA molecules.

OR

b What are DNA ligases? How do these enzymes participate in the recombinant DNA technology?

12 a Describe the salient features, advantages and disadvantages of using YAC.

OR

b Give a brief account on hosts for cloning and their properties.

13 a How will you construct a genomic DNA library?

OR

b Write any two methods involved in purification of recombinant proteins from cloned genes.

14 a Write briefly on Sanger's Di-deoxy chain termination method.

OR

b Enumerate the essential steps of the polymerase chain reaction with its applications.

15 a Describe the PCR based methods for site-directed mutagenesis.

OR

b Describe the CRISPR-Cas9 gene editing technology.

Z-Z-Z

END