

**D-6836**

**M.Sc. (III<sup>rd</sup> Semester) Examination, 2020**

**MICROBIOLOGY**

**(Recombinant DNA Technology)**

*Time Allowed : Three Hours*

*Maximum Marks : 70*

*Minimum Pass Marks : 28*

**SECTION - A**

**Note :** Attempt any ten questions. Each question carries one mark. **10×1=10**

**Q. 1.** Objective type :

Fill in the blanks type :

- (i) There are \_\_\_\_\_ classes of restriction enzymes.
- (ii) \_\_\_\_\_ chemical is used to make recombinant plasmid permeable to DNA molecules.
- (iii) Purification of DNA using silica derivative groups of DEAE is termed as \_\_\_\_\_.

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- (iv) \_\_\_\_\_ chemical stimulates direct DNA uptake in the cell.
- (v) Polymerase used for PCR is extracted from \_\_\_\_\_.

Multiple choice type :

- (vi) A plasmid vector contains how many elements :
  - (a) 1
  - (b) 2
  - (c) 3
  - (d) 4
- (vii) During DNA purification proteins can be removed by treatment of :
  - (a) Phenol & chloroform
  - (b) Sodium hydroxide
  - (c) Chloroform treatment alone
  - (d) Centrifuging

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to cure :

(x) Gene therapy in humans was first practiced

(a) 35

(c) 10

(b) 8

(a) 4

polymerase chain reaction :

DNA duplex after 4 cycles of (PCR)

(ix) How many DNA duplex is obtained from one

(a) Cyclic plasmid DNA

(c) Both (a) & (b)

(b) Tumor inducing plasmid DNA

(a) Chromosomal DNA

present in :

(viii) Virulence trait of *Agrobacterium tumefaciens*

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(a) None of these

(c) Vector

(b) Transformer

(a) Carrier

is integrated for cloning is called :

(xii) The DNA molecule to which the gene of insert

(a) All of these

(c) Molecular knives

(b) Molecular scalpels

(a) Biological scissors

(xi) Restriction enzymes are also called as :

diseases

(a) Severe combined immunodeficiency

(c) Thalassemia

(b) Haemophilia

(a) Cystic fibrosis

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**SECTION - B**

**Note :** Attempt any five questions. Each question carries 2 marks. **5×2=10**

**Q. 2.** Very Short Answer Type (25-30 words) :

- (i) Write a note on reverse transcriptase.
- (ii) What are two & three hybrid systems ?
- (iii) What is pedigree analysis ?
- (iv) What do you understand by gene augmentation ?
- (v) Name different strategies of gene delivery ?
- (vi) Explain artificial chromosomes giving suitable examples.
- (vii) Write any two applications of gene therapy.

**SECTION - C**

**Note :** Attempt any five questions. Each question carries 4 marks. **5×4=20**

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**Q. 3.** Short answer type (250 words) :

- (i) Explain nomenclature and types of restriction enzymes.
- (ii) What are plasmid ? Explain their structure and function.
- (iii) Describe microinjection method of gene delivery.
- (iv) Write a brief account on nucleic acid microarray strategies.
- (v) Discuss characteristics of recombinant proteins.
- (vi) Write short note on :
  - (a) Genomic library
  - (b) RFLP
- (vii) Explain restriction with its applications.

**SECTION - D**

**Note :** Attempt any three questions. Each question carries 10 marks. **10×3=30**

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**Q. 4.** Essay type (more than 500 words) :

- (i) Describe the process of purification, isolation and quantification of DNA & RNA.
- (ii) Give a detailed account of various vectors used in gene cloning.
- (iii) Explain the mechanism of recombinant DNA technology with applications.
- (iv) What is gene knockout technology ? Discuss in detail.

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