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( 6th Semester )

**ZOOLOGY**

Paper : ZL–XII (a)

**( Biotechnology and Bioinformatics )**

*Full Marks : 55*

*Time : 2½ Hours*

**( PART : A—OBJECTIVE )**

*( Marks : 20 )*

*The figures in the margin indicate full marks for the questions*

SECTION—A

*( Marks : 5 )*

Tick (✓) the correct answer in the brackets provided :

1×5=5

1. Each individual has a unique DNA fingerprinting as individuals differ in

(a) number of minisatellites ( )

(b) size of minisatellites ( )

(c) location of minisatellites ( )

(d) All of the above ( )

- 2.** The first cloning vector with circular DNA molecule discovered from *E. coli* was
- (a) plasmid ( )
  - (b) yeast artificial chromosome (YAC) ( )
  - (c) cosmid ( )
  - (d) bacteriophage lambda ( )
- 3.** Which process is used to insert normal genes into human cells to correct disorders?
- (a) Stem cell therapy ( )
  - (b) Gene therapy ( )
  - (c) Molecular cloning ( )
  - (d) cDNA library ( )
- 4.** A software that manages the computer hardware, and provides common services for execution of various application softwares is
- (a) resource management ( )
  - (b) information retrieval ( )
  - (c) job management ( )
  - (d) operating system ( )
- 5.** European Molecular Biology Laboratory (EMBL) mainly deals with
- (a) nucleotide sequence ( )
  - (b) amino acid sequence ( )
  - (c) genome sequence ( )
  - (d) protein sequence ( )

SECTION—B

( Marks : 15 )

Write short notes on the following in 5 to 8 sentences each :

3×5=15

1. Western blotting
2. Cloning vectors
3. Applications of genetic engineering in medicine
4. Information retrieval
5. Internet tools

( PART : B—DESCRIPTIVE )

( Marks : 35 )

*The figures in the margin indicate full marks for the questions*

1. There is a technique for selectively amplifying particular segments of DNA. Write an account of the principle, components and protocol of this technique with suitable illustration. 1½+1½+4=7

**OR**

Differentiate between gene sequencing and genomic sequencing. Explain the process of genome sequencing. 2+5=7

2. What do you mean by genetic engineering? Give a brief account on the basic procedure with a note on its major applications. 1+(4+2)=7

**OR**

Write an account on the enzymes used in genetic engineering. 7

3. What is gene library? Differentiate between genomic library and cDNA library. Write the basic steps of construction of gene library. 1+2+4=7

**OR**

Give a brief account on the applications of genetic engineering in agriculture. 7

4. Write an account on the concept of bioinformatics. Write a note on basic operating systems. 3+4=7

**OR**

Write notes on the following : 3½+3½=7

(a) Databases

(b) Internet for biologist

5. What do you mean by genome database? Write an account on NCBI. 1+6=7

**OR**

What is proteome database? Give an account on BLAST. 1+6=7

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