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(CBCS)

(6th Semester)

ZOOLOGY

TWELFTH (A) PAPER

(Biotechnology and Bioinformatics)

Full Marks : 75

Time : 3 hours

(PART : A—OBJECTIVE)

(*Marks : 25*)

The figures in the margin indicate full marks for the questions

SECTION—A

(*Marks : 10*)

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

1×10=10

1. Western blotting technique is the detection and isolation of

- (a) cells ()
- (b) RNA ()
- (c) DNA ()
- (d) proteins ()

2. In northern blotting, RNA molecules are separated according to their sizes using

- (a) gel electrophoresis ()
- (b) polyacrylamide gel ()
- (c) nitrocellulose membrane ()
- (d) capillary blotting ()

3. A small circular DNA found in bacteria and some other organisms, that can replicate independently of the host cell chromosome is called
- (a) bacteriophage ()
 - (b) cosmid ()
 - (c) plasmid ()
 - (d) yeast artificial chromosome (YAC) ()
4. Which is the correct cloning size of the following vectors?
- (a) Plasmids 5–10 kb, -phage 35–45 kb, cosmid ~15 kb ()
 - (b) Plasmids ~ 15 kb, -phage 35–45 kb, cosmid 5–10 kb ()
 - (c) Plasmids 5–10 kb, -phage ~ 15 kb, cosmid 35–45 kb ()
 - (d) Plasmids 35–45 kb, -phage ~ 15 kb, cosmid 5–10 kb ()
5. Gene library is a collection of
- (a) mRNA from different species ()
 - (b) DNA from different organisms ()
 - (c) nucleic acids from a single organism ()
 - (d) genomic DNA from a single organism ()
6. The first mammal cloned 'Dolly' is produced by using
- (a) somatic cell nuclear transfer technology ()
 - (b) the Honolulu technique ()
 - (c) the Roslin technique ()
 - (d) artificial twinning ()
7. The most commonly used search engine that had about 1600000000 monthly visitors in 2018 is
- (a) Yahoo ()
 - (b) Ask.com ()
 - (c) Bing ()
 - (d) Google ()
8. The data that contain original biological data in a raw, sequence or structural data, directly submitted by the authors is
- (a) primary data e.g. GenBank, EMBL and DDBJ ()
 - (b) secondary data e.g. SWISS-Prot and PIR ()
 - (c) tertiary data e.g. NCBI ()
 - (d) specialized data e.g. TADB, DrugBank ()

9. You have a protein sequence and you wish to compare it with other proteins. Which of the following Blast programs should you use?

- (a) Blastn ()
- (b) Blastp ()
- (c) Blastpgp ()
- (d) Blastx ()

10. A free search engine, accessing primarily the MEDLINE database of references and abstracts on life sciences and biomedical topics, is

- (a) Medpub ()
- (b) Pubmed ()
- (c) NCBI ()
- (d) askMEDLINE ()

SECTION—B

(Marks : 15)

Write short notes on the following :

3×5=15

1. DNA fingerprinting

OR

Southern blotting

2. Restriction enzymes

OR

DNA ligase

3. Gene therapy

OR

Genetic engineering in medicine

4. Databases

OR

Search engines

5. BLAST(N)

OR

PDB

(PART : B—DESCRIPTIVE)

(Marks : 50)

The questions are of equal value

1. What technique is employed for selective amplification of a particular segment of DNA? Write an account of its working mechanism and its applications.

OR

What do you mean by genome sequencing? Elucidate the process of genome sequencing.

2. Discuss the concept of genetic engineering.

OR

What is cloning? Write an account of the concept of gene cloning.

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

OR

Differentiate between cDNA library and genomic library. Write an account on the basic concept of gene library.

4. What do you mean by bioinformatics? Explain the concept of basic operating systems.

OR

Write an account of genomic and protein sequence retrieval.

5. Give an account of genomic and proteomic database.

OR

Explain the steps of phylogenetic analysis using MEGA.
