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(CBCS)

(6th Semester)

ZOOLOGY

TWELFTH(A) PAPER

(Biotechnology and Bioinformatics)

Full Marks : 75

Time : 3 hours

The figures in the margin indicate full marks for the questions

(SECTION : A—OBJECTIVE)

(*Marks* : 10)

Tick (✓) the correct answer in the brackets provided :   1×10=10

1. Restriction endonuclease is an enzyme that cuts DNA at or near specific recognition nucleotide sequences known as restriction sites
  (a) POLY, *Eco*RI, RNase   (   )
  (b) DNA Pol, *Bam*HI, *Hind* II   (   )
  (c) *Hind* III, POL1, *Hox*   (   )
  (d) *Eco*RI, *Bam*HI, *Hind* III   (   )

2. PCR technique was invented by
  (a) Kary Mullis   (   )   *(b)* Boyer   (   )
  (c) Sanger   (   )   *(d)* Cohen   (   )

3. The term 'bioinformatics' was coined by
  (a) Frank Tekaia   (   )   *(b)* Poulis Lewis   (   )
  (c) Paulien Hogeweg   (   )   *(d)* All of them   (   )

4. A method for transferring protein to a nitrocellulose filter on which protein can be detected by a suitable probe is
  (a) Southern blotting   (   )   *(b)* Northern blotting   (   )
  (c) Western blotting   (   )   *(d)* PCR   (   )

5. Who discovered restriction enzymes?

(a) Watson and Crick   (   )

(b) Jacob and Monod   (   )

(c) Nathans, Arber and Smith   (   )

(d) Boyer and Cohen   (   )

6. The polymerase chain reaction (PCR)

(a) is used to transcribe specific genes   (   )

(b) amplifies specific DNA sequences   (   )

(c) uses a DNA polymerase that denatures at 55 °C   (   )

(d) is a method for sequencing DNA   (   )

7. Which of the following is true regarding search engines?

(a) Seznam, NCBI, Europa   (   )

(b) EMBL, WolframAlpha   (   )

(c) Seznam, DDBJ   (   )

(d) WolframAlpha, aol.com, Seznam   (   )

8. URL of NCBI is

(a) https://www.ncbi.ac.uk/   (   )

(b) https://www.ncbi.us.gov/   (   )

(c) https://www.ncbi.uk.in/   (   )

(d) https://www.ncbi.nlm.nih.gov/   (   )

9. GenBank, the nucleic acid sequence database is maintained by

(a) Brookhaven Laboratory   (   )

(b) DNA Database of Japan (DDBJ)   (   )

(c) European Molecular Biology Laboratory (EMBL)   (   )

(d) National Centre for Biotechnology Information (NCBI)   (   )

10. Which of the following is a sequence alignment tool?

(a) BLAST   (   )

(b) PRINT   (   )

(c) PROSITE   (   )

(d) PIR   (   )

(SECTION : B—SHORT ANSWER)

(*Marks* : 15)

Write notes on the following in *5* to *8* sentences each : 3×5=15

UNIT—I

1. Northern blot technique

OR

2. Primer

UNIT—II

3. Enzymes in genetic engineering

OR

4. Principle of cloning

UNIT—III

5. Applications of genetic engineering in agriculture

OR

6. Applications of gene therapy

UNIT—IV

7. Biological search engines

OR

8. Genomic sequence retrieval system

UNIT—V

9. NCBI

OR

10. MEGA

(SECTION : C—DESCRIPTIVE)

(*Marks* : 50)

Answer the following questions :   10×5=50

UNIT—I

1. Explain DNA fingerprinting. Discuss the principle and application of DNA fingerprinting.

OR

2. Write short notes on :
   (a) Application of PCR
   (b) Southern blotting technique

UNIT—II

3. Explain Human Genome Project. Give a brief account of genome sequencing.

OR

4. Write short notes on :
   (a) Restriction enzymes
   (b) DNA ligase

UNIT—III

5. Explain genetic engineering. Give a brief account on the applications of genetic engineering in medicine.

OR

6. Write short notes on :
   (a) Gene library
   (b) GMO

UNIT—IV

7. What is bioinformatics? Give an account on the applications of bioinformatics.

OR

8. Write short notes on :
   (a) Basic operating systems
   (b) Protein sequence retrieval

UNIT—V

9. What is protein data bank? Give a brief account of PDBe and its applications.

OR

10. Write short notes on :
(a) PubMed
(b) BLAST

★ ★ ★