



PP-451

Seat No. _____

B. Sc. (Sem. VI) Examination

April / May - 2016

CC-I-12 : Biotechnology : Paper - XII
(Genetic Engineering)

Time : 3 Hours]

[Total Marks : 70

1 Answer the following : 15

(1) Which restriction enzyme leaves sticky ends in the restricted DNA?

- (A) EcoRI (B) PstI
(C) BamHI (D) All of the above.

(2) _____ technique are DNA fragments physically separated according to their size.

- (A) Southern blot.
(B) Agarose gel electrophoresis.
(C) SDS-PAGE.
(D) Northern blot.

(3) The enzyme used in PCR reactions is derived from which organism?

- (A) *Escherichia coli*.
(B) *Thermus aquaticus*.
(C) *Thermotoga agrobilium*.
(D) *Saccharomyces cerevisiae*.

(4) For a PCR reaction which of the following is NOT required?

- (A) Taq Pol. (B) dNTP's.
(C) Probes. (D) Template DNA.

- (5) cDNA is _____
- (A) DNA with both introns and exons that can be cloned into prokaryotes.
 - (B) DNA with only introns that can be cloned into prokaryotes.
 - (C) eukaryotic DNA with only exons that can be cloned into prokaryotes.
 - (D) used to make precursor mRNA.
- (6) _____ is/are required to produce the recombinant plasmid.
- (A) Restriction endonuclease.
 - (B) DNA polymerase.
 - (C) DNA Ligase.
 - (D) Only (A) and (C).
- (7) RFLPs result because individuals in a population have _____
- (A) DNA sequence differences that create different proteins.
 - (B) different mutations that alter the length of their mRNA.
 - (C) DNA sequence differences that create different proteins.
 - (D) DNA sequence differences in the pattern of restriction sites.
- (8) Arrange the following events in the proper sequence for gene cloning. 1 = Incorporate gene into bacterial plasmid. 2 = Isolate DNA from organism containing desired gene. 3 = Incorporate cloned gene into bacterial cells. 4 = Fragment DNA with restriction enzyme.
- (A) 1, 2, 3, 4.
 - (B) 2, 1, 4, 3.
 - (C) 2, 4, 1, 3.
 - (D) 2, 4, 3, 1.

- (9) Sticky ends are _____
- (A) single-stranded DNA sequences that are generated by staggered cuts.
 - (B) double-stranded DNA sequences that are generated by staggered cuts.
 - (C) different from cohesive ends.
 - (D) single-stranded DNA sequences that are generated by blunt cuts.
- (10) A probe is used in which stage of the gene transfer process?
- (A) DNA cleavage
 - (B) Recombination.
 - (C) Cloning.
 - (D) Screening.
- (11) Genetic engineering has successfully transferred genes from eukaryotic cells into _____
- (A) bacteria
 - (B) plants.
 - (C) animals.
 - (D) all of the above.
- (12) Restriction enzymes are involved in all of the following genetic engineering techniques EXCEPT _____
- (A) cloning DNA into vectors.
 - (B) mapping studies.
 - (C) identification of genetic markers.
 - (D) PCR.
- (13) A "YAC" is a useful _____
- (A) vector.
 - (B) screen.
 - (C) probe.
 - (D) library.
- (14) What is primer
- (15) What is the full form of PUC₁₈ Plasmid.

2 Write short answers of any Five question : $3 \times 5 = 15$

- (1) Draw the schematic Diagram of rDNA Process.
- (2) Explain the structure of Plasmids pBR 322.
- (3) Explain Difference between YAC and BAC.
- (4) Give the Full form of RFLP, SNT, RT-PCR.
- (5) Northern blotting application.
- (6) Give the Full Form of AFLP, ssDNA , SNTs.
- (7) Write a note on Dolly ship.

3 Long Answers any four question : $5 \times 4 = 20$

- (1) Explain Microarray DNA sequencing Method with application
- (2) Explain Cloning Vector
- (3) Explain FISH method and its application
- (4) Explain RAPD with diagram
- (5) Write a Note on Western Blotting technique
- (6) Write a Note on Molecular Scissor

4 Very Long Answers any two : $10 \times 2 = 20$

- (1) Explain Gene Therapy
- (2) Write a Note on PCR and its Applications
- (3) Explain the Sanger DNA sequencing Method and its limitations.