



DM-003-006404

Seat No. _____

**Second Year B. Sc. (Bioinformatics) (Sem. IV)
(CBCS) Theory Examination**

April / May - 2015

B. Sc. BI - 404 : Genetic Engineering

Faculty Code : 003

Subject Code : 006404

Time : Hours]

[Total Marks :

SECTION - I

- 1 Plasmids are supercoiled with the help of _____.
 - (a) Helicase
 - (b) DNA gyrase
 - (c) Topoisomerase
 - (d) None
- 2 _____ are responsible for transfer of genes during conjugation
 - (a) crp genes
 - (b) tra genes
 - (c) cro genes
 - (d) trp genes
- 3 _____ is the restriction site of EcoRI
 - (a) GAA/TTC
 - (b) G/AATTC
 - (c) GA/ATTC
 - (d) GAAT/TC
- 4 Type II Restriction are _____enzymes and have _____ target sequence
 - (a) Two enzymes, symmetrical sequence
 - (b) One enzyme, symmetrical sequence
 - (c) Two enzymes, asymmetrical sequence
 - (d) One enzyme, asymmetrical sequence

- 5 Taq is the name of
- (a) Ligase
 - (b) Kinase
 - (c) Polymerase
 - (d) Reverse Transcriptase
- 6 Pyrosequencing is based on
- (a) Radioactivity
 - (b) Fluorescence dye
 - (c) Carbon 14
 - (d) Express Electromagnetic field
- 7 Mutagenesis is done to
- (a) Recombine the DNA
 - (b) Insert the new fragment
 - (c) the gene
 - (d) Analyse the clone
- 8 Yeast two hybrid system is useful for
- (a) Replication studies
 - (b) Protein synthesis studies
 - (c) Protein- protein interaction studies
 - (d) All of the above
- 9 For ligase chain reaction following is not true
- (a) In this Ligase is added
 - (b) In this Polymerase is used
 - (c) In this Polymerase is not used
 - (d) This is used for analysing mutation

10 In PCR there are

- (a) Two primers complementary to each other are used
- (b) Only one primer is used
- (c) Two primers complementary to each strand is used
- (d) None of the above

11 Functions of a probe

- (a) Identification of gene
- (b) Forensic science
- (c) Molecular marker
- (d) All of above

12 Exonuclease means cutting the nucleotides from

- (a) One end of DNA
- (b) Both ends of DNA
- (c) Within the DNA
- (d) None

13 RE is required in

- (a) Probe detection
- (b) RFLP
- (c) RAPD
- (d) All of the above

14 Kinase helps to

- (a) Add phosphate group
- (b) Remove ketone
- (c) Add ketone
- (d) None of the above

- 15 Following is not true for High throughput screening
- (a) It is manual
 - (b) It is used for genetic engineering
 - (c) Robotics is one of its principles
 - (d) All of the above
- 16 A small, circular DNA molecule used as a vector to transmit foreign DNA is a:
- (a) Plasmid
 - (b) Prion
 - (c) Liposome
 - (d) Lipofectin
- 17 Lipofection is a type of
- (a) Cloning technique
 - (b) Vector
 - (c) Gene transfer technique
 - (d) Blotting technique
- 18 Phenol, chloroform and water solution is used for
- (a) Dissolving DNA
 - (b) Phase differentiation
 - (c) Chelating process
 - (d) None of the above

19 λ DNA is DNA of

- (a) Plasmid
- (b) Cosmid
- (c) Bacteriophage
- (d) BAC

20 Competent cell formation is the step of

- (a) Conjugation
- (b) Transformation
- (c) RE
- (d) Agarose gel electrophoresis

SECTION - II

1 (A) Answer **any three** of the following

2×3=6

- (a) Define sequencing.
- (b) Enlist all gene transfer techniques.
- (c) What are DNA arrays?
- (d) What is a phage write its types?
- (e) What is a probe?
- (f) Define cDNA library.

(B) Answer **any three** of the following **3×3=9**

- (a) Write a note of phosphatase.
- (b) Describe plasmid as cloning vector.
- (c) Explain chromosome walking.
- (d) How mutagenesis helps for analysis of recombinant DNA ?
- (e) What are expression systems ? Give its applications.
- (f) What are ligases? What role does it plays in genetic engineering ?

(C) Answer **any two** of the following **5×3=10**

- (a) Action mechanisms of Kinases and phosphatases.
- (b) Any two sequencing techniques.
- (c) Enlist different steps of PCR, its types and applications.
- (d) Molecular diagnostics for high throughput screening.
- (e) Plasmid DNA isolation.

2 (A) Answer **any three** of the following **2×3=6**

- (a) Define genetic engineering.
- (b) Define RFLP.
- (c) What is a shuttle vector?
- (d) What is cloning?
- (e) Write four examples of heat stable polymerases.
- (f) Write types of nucleases with examples.

(B) Answer **any three** of the following **3×3=9**

- (a) Enlist all applications of probe
- (b) Enlist all types of polymerases and write its function
- (c) Explain all chemical techniques for gene transfer
- (d) What are the general steps of genomic DNA isolation?
- (e) What is polymerase chain reaction?
- (f) Write about *E.coli* & animal cells as cloning hosts

(C) Answer any two of the following

- (a) Probe construction
- (b) R M systems
- (c) Steps of genetic engineering
- (d) YACs & BACs
- (e) Yeast two hybrid system
