[66] **Seat No._____** **No of Printed Pages: 02**

SARDAR PATEL UNIVERSITY
5th Semester B.Sc Examination
Saturday, 18th November 2019
10:00 a.m. to 01:00 p.m.
Subject: Bioinformatics
Paper Code: US05CBNF04
(Genetic Engineering-I)

Note: i) Attempt all questions. **Total Marks: 70**
ii) Marks are indicated on the right hand side.

Q.1 Answer the following Multiple Choice Questions. All are compulsory **10**

1. The DNA molecule to which the gene of insert is integrated for cloning is called
   a) Carrier b) Transformer c) Vector d) Non of these.
2. In orger to insert a foreign gene into a plasmid both must _____
   a) Have identical DNA sequence b) Originate from the same type of cell c) be cut by the same restriction enzyme d) be of the same length.
3. An expression vector
   a) Always contains an origin of replication b) Usually contains a gene that confers antibiotic resistance to the bacterial host c) Always contains DNA segment for the regulation of mRNA production d) All of the above.
4. The mechanism of intake of DNA fragment from the surrounding medium by a cell is called
   a) Transformation b) Transduction c) Both a & b d) Conjugation
5. The most popular and widely used engineered plasmid vector is
   a) pBR 322 b) pUC Vector c) pSC101 d) M13
6. Which of the following is a chemical nucleotide sequence method
   a) Automated sequencing method b) Sanger method c) Edmans method d) Maxans-Gilbert method
7. Ti plasmid that is used as a plant vector is obtained from
   a) *Agrobacterium tumefaciens* b) *Agrobacterium rhizhogenes* c) *Agrobacterium radiobactor* d) *Thermus aquaticus*
8. A human cDNA library
   a) Contains DNA for specific human proteins b) Contains DNA for virtually all of the human proteins in vectors c) Cannot be used to obtain human genes because it would be radioactive d) none of the above.
9. *Thermus aquaticus* is the source of
   a) *Taq polymerase* b) Vent polymerase c) Both a and b d) Primase enzyme
10. Both DNA gel electrophoresis and SDS-PAGE of protein are similar because
    a) In both the cases molecules migrate to the anode b) Both techniques rely on a constant charge to mass ratio c) Both techniques utilize the sieving properties to gels d) all of the above.

(P.T.O)

Q.2	**Attempt *Any ten* of the following**	**2X10=20**
1.	What is r DNA?	
2.	Enlist essential features of cloning vectors	
3.	How a blunt ended DNA can be converted to sticky ends?	
4.	What is SV 40 vector?	
5.	What is blue white selection? Give the name of the plasmid vector used for blue white selection.	
6.	Write the application of genomic cDNA library	
7.	Give the difference between Maxam Gilbert and Sanger method of DNA sequencing.	
8.	What is chromatography?	
9.	What do you mean by transformation?	
10.	List the factors affecting gel electrophoresis.	
11.	What is RT-PCR?	
12.	Write principle of HPLC.	
Q.3 A	Explain the features and properties of pUC 8 with suitable map	**06**
B	What are restriction enzymes? Write a note on type II restriction enzymes.	**04**
	OR	
Q.3 A	With the help of diagram explain various steps involved in the construction of recombinant DNA.	**05**
B	Write short notes on properties and application of DNA polymerase.	**05**
Q.4 A	How can you cloned gene through YAC vector? Explain	**05**
B	Write short notes on application of shuttle vector	**04**
	OR	
Q.4 A	Explain various types of Ti plasmid based vector	**05**
B	Write note on retrovirus vector.	**05**
Q.5 A	What is insertional inactivation? Explain with suitable examples	**06**
B	Explain any method for construction of genomic DNA library.	**04**
	OR	
Q.5	Explain various methods used for recombinant selection and screening.	**10**
Q.6 A	With the help of diagram explain various steps of PCR and list its applications.	**05**
B	Write short notes on Sanger method of DNA sequencing.	**05**
	OR	
Q.6 A	Write note on polyacrylamide gel electrophoresis.	**06**
B	Explain importance of DNA sequencing.	**04**