



**LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034**

**M.Sc. DEGREE EXAMINATION – BIOTECHNOLOGY**

**SECOND SEMESTER – APRIL 2015**

**BT 2823 - GENE MANIPULATION TECHNOLOGY**

Date : 16/04/2015  
Time : 01:00-04:00

Dept. No.

Max. : 100 Marks

**PART – A**

**ANSWER ALL THE QUESTIONS:**

**(20 marks)**

**I. Choose the correct answer:**

**(5 x 1 = 5 marks)**

- 1) Which of the following is a rare cutter enzyme?  
a) *Not I*                      b) *Sau 3A*                      c) *PstI*                              d) *Hinf I*
- 2) *Cos* site is absent in which of the following vectors?  
a) Plasmid                      b) Cosmid                      c) Phagemid                      d) Charon Phage
- 3) Which of the following vectors uses *His* marker for selection?  
a) Yeast                      b) pUC18                      c) pBR322                      d) EMBL4
- 4) Random primers are used in \_\_\_\_\_ reaction  
a) cDNA synthesis                      b) Nick translation  
c) End labeling                      d) *In vitro* translation
- 5) What is the contribution of Leroy Hood to Biology?  
a) DNA sequencing                      b) PCR  
c) DNA Fingerprinting                      d) Automated DNA sequencing

**II. State whether true or false, if false give reason**

**(5 x 1 = 5 marks)**

- 6) When genomic DNA is digested with a 4- cutter enzyme, it produces more fragments than digesting with a 6-cutter enzyme.
- 7) The size of pBR322 vector is greater than pUC18.
- 8) SV40 vector integration to human is a random event.
- 9) cDNA contains only coding sequences.
- 10) Magnesium Chloride standardization is a very important aspect of PCR.

**III. Complete the following:**

**(5 x 1 = 5 marks)**

- 11) X- gal is used in transformation as a \_\_\_\_\_.
- 12) The cloning capacity of cosmid vector is \_\_\_\_\_ Kb.
- 13) UAS stands for \_\_\_\_\_ in \_\_\_\_\_
- 14) The number of clones required for constructing a complete human genomic library in phage vector is \_\_\_\_\_
- 15) The heating and cooling in PCR machine is due to \_\_\_\_\_ effect.

**IV. Answer each of the following within 50 words.**

**(5 x 1 = 5 marks)**

- 16) What are Isoschizomers? Cite an example.
- 17) Define Hogness box.
- 18) What is a cryptic plasmid?
- 19) Mention the genome size of *Arabidopsis thaliana*.
- 20) Enlist the purposes of site-directed mutagenesis

## PART – B

**Answer the following questions, each within 500 words only. Draw diagrams wherever necessary. (5 x 8 = 40 marks)**

21 a) Discuss the enzymes used in modifying the ends of DNA with diagram?

**OR**

b) Enumerate the characteristics of various types of restriction enzymes.

22 a) Explain the construction of pBR322 vector with a diagram. Also explain the concept of insertional inactivation in pBR322 plasmid.

**OR**

b) Give the procedure for separating M13 single stranded and replicative forms. Mention its uses in rDNA technology.

23 a) Distinguish between YAC and YRp vectors used in yeast cloning.

**OR**

b) Give an account on SV40 vector.

24 a) Write a note on autoradiography.

**OR**

b) Discuss cDNA mapping.

25 a) Explain nested PCR with a diagram.

**OR**

b) Enumerate the procedure involved in site-directed mutagenesis with diagram.

## PART – C

**Answer any Two of the following, each within 1500 words. Draw diagrams wherever necessary. (2x 20 = 40 marks)**

26. Describe the procedure for bacterial transformation, and explain the concept of blue/white screening, Mention the formulae for calculating the transformation efficiency.

27 Schematically explain the expression of a gene in Baculovirus expression system. Cite two proteins expressed using this system.

28 Describe DNA foot-printing technique with a suitable diagram.

29 Discuss the production of human tissue plasminogen activator (tPA) in sheep with diagram.

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