



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

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

THIRD SEMESTER – NOVEMBER 2015

**BT 3956 - FUNCTIONAL GENOMICS**

Date : 13/11/2015  
Time : 09:00-12:00

Dept. No.

Max. : 100 Marks

**Part- A**

**Answer all the questions: (20 Marks)**

**I. Choose the correct answer (5 × 1 = 5)**

1. What is the reason behind increased genome size in Amoeba?  
a) C value paradox      b) Variation      c) Inbreeding      d) Mutational load
2. Which of the following substrate is suitable for fluorescent probes?  
a) Nylon      b) Silica      c) Glass      d) Quartz
3. Among the following which technology can be used to study proteins EXCEPT?  
a) SPR      b) MS/MS      c) NMR      d) SAGE
4. Which of the following uses antibodies to study proteins?  
a) SPR      b) FRET  
c) Immunoprecipitation      d) Pull down assay
5. Which among the following technique was used to study globin gene?  
a) RNAi      b) Gene knockout      c) Ectopic expression      d) Insertional mutagenesis

**II State whether the following are True or False; if false give reason (5 × 1 = 5)**

6. Luciferase is used to degrade the excess nucleotide bases.
7. Operons are not found in prokaryotes.
8. Genes are upregulated in cancers.
9. Nitrosylation is very important for cell cycle progression.
10. Metabolomics and metagenomics are same.

**III Complete the following (5 × 1 = 5)**

11. The longer arm of chromosomes is denoted as \_\_\_\_\_.
12. Cy 3 gives \_\_\_\_\_ fluorescence.
13. The technique that can be used to identify gene with low expression levels is \_\_\_\_\_.
14. \_\_\_\_\_ and \_\_\_\_\_ are common transient protein transient binding domains.
15. Most drug metabolizing enzymes belong to \_\_\_\_\_ family of proteins.

**IV Answer the following, each in about 50 words only: (5 × 1 = 5)**

16. What is alternate splicing?
17. List one application of microarray technology.
18. Name the enzymes used in SAGE.
19. Mention any two biological significance of protein interaction.
20. What is metabolic profiling?

## Part B

Answer the following, each in about 500 words;

(5 × 8 = 40)

Draw diagrams wherever necessary

21. a) Describe the four levels of annotation.

**OR**

b) Illustrate the principle behind pyrosequencing.

22. a) Comment on the various substrates and dyes used in DNA microarrays.

**OR**

b) Discuss about gene expression in eucaryotes.

23. a) Explain nuclease protection assay for RNA analysis.

**OR**

b) Compare SAGE and MPSS.

24. a) Mention any four online sources to study protein interactions.

**OR**

b) Review about the different types of protein- protein interactions.

25. a) Briefly explain gene knockout through homologous recombination.

**OR**

b) Discuss the pharmacokinetic and pharmacodynamic properties of drugs.

## Part C

Answer any two of the following, each in about 1500 words;

(2 × 20 = 40)

Draw diagrams wherever necessary

26. Elaborate RNA analysis using realtime qPCR.

27. Write in detail about any four techniques to study protein-protein interaction.

28. Explain about any two methods of genome sequencing and add a note on *de novo* genome assembly.

29. Describe about antisense RNA technology and RNAi.

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