



LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

M.Sc. DEGREE EXAMINATION – BIOTECHNOLOGY

THIRD SEMESTER – NOVEMBER 2017

BT 3956 - FUNCTIONAL GENOMICS

Date: 09-11-2017
Time: 09:00-12:00

Dept. No.

Max. : 100 Marks

PART – A

Answer ALL the Questions

I. Choose the correct answer

(5 x 1 = 5 Marks)

1. Identification of genes and functions belongs to which type of annotation
 - a) 1
 - b) 2
 - c) 3
 - d) 4
2. Gefitinib inhibits which of the following
 - a) Tyrosine kinase
 - b) Methyl transferase
 - c) Serotonin
 - d) Adrenergic receptor
3. Which of the following is the most sensitive gene expression quantification assay?
 - a) Northern blot
 - b) RPA
 - c) Real time PCR
 - d) *In situ* hybridization
4. Choose the post translation modification required for cell cycle progression.
 - a) Methylation
 - b) Phosphorylation
 - c) Acetylation
 - d) Nitrosylation
5. Which among the following is NOT a reverse genetics approach?
 - a) RNAi
 - b) Gene knockout
 - c) Chemical mutagenesis
 - d) Insertional mutagenesis

II. State whether the following are true or false.

(5x1=5 Marks)

6. Telomeric regions have repetitive sequences.
7. Oligonucleotide arrays are more specific than cDNA arrays.
8. *Fluorescent In situ* hybridization is not a mRNA expression quantification technique.
9. The protein used to precipitate the target protein is called the bait
10. snRNAs are small nucleolar RNAs.

III. Complete the following

(5 x 1= 5 Marks)

11. The number of genes in *S. cerevisiae* is _____.
12. _____ are proteins that activate the transcription of DNA by binding to DNA.
13. DIP stands for _____.
14. Attachment of oligosaccharide to proteins happens in _____.
15. The length of miRNA is _____.

IV. Answer the following within 50 words

(5 x 1 = 5 Marks)

16. What is C value paradox?
17. What is the function of long non coding RNA
18. Mention the significance of dye flip.
19. Define proteome.
20. What is metabolic profiling?

PART B

Answer the following each within 500 words.

(5 x 8 = 40 marks)

Draw diagrams wherever necessary

21. (a) Mention the four levels of annotation in *E.coli*

OR

(b) Discuss the complexity of eukaryotic genome.

22. a) Comment on the gene expression patterns.

OR

(b) Explain in detail the principle behind real time PCR technique.

23. (a) Devise a method to quantify RNA.

OR

(b) Write about transcriptional profiling.

24. (a) Mention the any FOUR online sources to study protein-protein interactions and their significance.

OR

(b) Write an account on Phosphorylation and glycosylation.

25. (a) Explain gene knockout of globin mouse.

OR

(b) Outline the methodology of metabolomic analysis

PART – C

Answer any TWO of the following, each within 1500 words.

(2 x 20 = 40 Marks)

Draw diagrams wherever necessary.

26. Elaborate on any two sequencing methods.

27. Write in detail about Microarray technology and add a note on its applications.

28. Describe yeast two hybrid assay and co-immunoprecipitation of protein-protein complexes.

29. Explain in detail about siRNA and miRNA mediated RNA interference.
