LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

M.Sc. DEGREE EXAMINATION – **ZOOLOGY**

THIRD SEMESTER – NOVEMBER 2016

ZO 3950 - GENOMICS, METAGENOMICS & EPIGENETICS

Date: 09-11-2016 Dept. No. Max. : 100 Marks

Time: 09:00-12:00

Part-A

Answer all the questions **(10×2=20 Marks)**

1. Differentiate between prokaryotic and eukaryotic promoters.
2. Describe the mitochondrial DNA.
3. What is meant by gene knockout?
4. What are protein structure databases? Explain with example.
5. What is the Sargasso sea project?
6. Enlist the potential challenges of next generation sequencing technologies.
7. Give the soil metagenomic insights into biogeochemical cycles.
8. Explain sequence based screening for small molecules with respect to polyketide synthase.
9. Explain the role of methylation in changing chromatin structure.
10. Describe the epigenetic role of the RIP complex in *Neurospora crassa*.

Part-B

Answer any FOUR questions **(4×10=40 Marks)**

11. Explain the technique of restriction mapping.
12. Explain the following:
    (i) Protein evolution by exon shuffling
    (ii) *De novo* identification of genes using *in silico* gene prediction tools.
13. Discuss the acid mine drainage project.
14. Write notes on ocean metagenomic studies.
15. Describe prokaryotic gene organization.
16. Write a note on the role of small noncoding RNAs in chromatin assembly.

Part-C

Answer any TWO questions **(2×20=40 Marks)**

17. Write a note on the organization of eukaryotic genome.
18. Describe the following:
    (i) Metagenomic study of *Buchnera*-aphid symbiosis
    (ii) Expected benefits of large scale metagenomics projects
19. Discuss the working mechanism of AB SOLiD sequencer.
20. Explain the following:
    (i) Role of RNA interference in heterochromatin assembly in *S. pombe*
    (ii) Epigenetics in *S. cerevisiae*

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