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## Fifth Semester B.E. Degree Examination, Feb./Mar. 2022 Genomics and Proteomics

Time: 3 hrs.

Max. Marks: 100

**Note: Answer any FIVE full questions, choosing ONE full question from each module.**

### Module-1

- 1 a. Describe the relevance of Genomic databases related to model organisms. Substantiate their applications in Genomics studies. (10 Marks)
- b. Define the terms Genes, Genomics, Proteomes, Geonomics and Proteomics. Explain the central dogma of Molecular Biology in brief. (10 Marks)

**OR**

- 2 a. Give detailed account of Sangers Dideoxy method of DNA sequencing. (08 Marks)
- b. What are the challenges faced by the shot gun approach to sequence DNA from a limited source? (07 Marks)
- c. Sample 1 : AT GCG G TA CGAT ; Sample 2 : AT GCG C TA CGAT  
How is the above substitution classified? Substantiate the possible effects of such mutations. (05 Marks)

### Module-2

- 3 a. What are ESTs? Elaborate its applications in Genomics. (10 Marks)
- b. Define Genotyping. Explain how DNA chips are used for genotyping. (10 Marks)

**OR**

- 4 a. What are Mutations? Explain the different types of chromosomal and Gene mutation, with examples. (08 Marks)
- b. Write a note on Comparative Genomics. (06 Marks)
- c. Give at least 3 applications of SNPs. (06 Marks)

### Module-3

- 5 a. Explain the organization of Genomes within the nucleus. (09 Marks)
- b. Differentiate the salient aspects of gene regulation process in Prokaryotes and Eukaryotes. (06 Marks)
- c. Write a note on the Cvalue paradox. (05 Marks)

**OR**

- 6 a. Elaborate on SiRNA and its applications in various fields. (12 Marks)
- b. Write a note on the importance of various Post Translational Modifications in Eukaryotes. (08 Marks)

### Module-4

- 7 Highlight the applications of the following Techniques with examples :
  - a. RFLP.
  - b. AFLP.
  - c. SCAR.
  - d. Telomerase as molecular markers. (20 Marks)

OR

- 8 a. Write in detail the applications of Micro arrays and the various methods of analysis. (10 Marks)
- b. Elucidate the process and principle behind : (10 Marks)
- i) FisH                      ii) Marker assisted selection.

**Module-5**

- 9 a. Provide an Account on the different Protein Quantification methods. (08 Marks)
- b. What are Protein – based drugs? Comparatively discuss how protein based drugs act in human systems. (08 Marks)
- c. Illustrate the yeast two hybrid systems to study protein interaction. (04 Marks)

OR

- 10 a. How is 2 – D PAGE technique useful in Proteome analysis? Explain in detail with a case study. (12 Marks)
- b. Justify the statement “Proteomics is a valuable tool for plant genetics and selective breeding”. (08 Marks)

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