

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATIONS-2024

M.Sc-II Semester (BT)

COURSE CODE (CREDITS): 20MS1BT214 (2)

MAX. MARKS: 25

COURSE NAME: GENOMICS & PROTEOMICS

COURSE INSTRUCTOR: DR. JATA SHANKAR

MAX. TIME: 1 Hour 30 Min

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*Note: All questions are compulsory. Marks are indicated against each question in square brackets.*

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- Q1. What is the genome size of *E. coli* and how many genes encoding proteins are estimated to be present in *E. coli*? Calculate gene density and draw a relation with the human genome [3.5 marks] CO I
- Q2. State with example the role of pharmacodynamic factors in the efficacy of the drug to be sensitive and resistant against cancer cases [3.5 marks] CO II
- Q3. How to differentiate between SNP and point mutation in population studies, explain with example. Explain the role of SNP in cancer biology, and identify a few studies that show a good linkage and no linkage to the cancers. [3.5 marks] CO II
- Q4. What are the salient features of DNA microarray? Describe the methodology to identify and quantify the gene expression of two different conditions, say drug-resistant and drug-sensitive bacteria? [3.5 marks] CO II
- Q5. The human genome project is a landmark in science, what are the important findings of the projects and how much of the genome (in MB and percentage) is estimated to be a gene? What is the difference between coding and non-coding regions in the genome? [3.5 marks] CO II
- Q6. Explain sequence-based and function-based metagenomics. Give insight into the human microbiome projects enabling the importance of the microbes/their significance or how microbial communities serve as biological pumps in maintaining the balance of organic carbon vs inorganic carbon content in the environment? [3.5 marks] CO II
- Q7. Write down the mechanism of Sanger's sequencing and an account of the mitochondrial genome? [4 marks] CO II