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JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATIONS-MARCH 2026

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

Note: *(a) All questions are compulsory.*

(b) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems

Q.No	Question	Marks
Q1	Define Single Nucleotide Polymorphisms (SNPs) and explain their origin, types, and significance in the human genome. Discuss the role of SNPs in genetic variation, disease susceptibility, and personalised medicine	4
Q2	Explain how genetic variations in patients influence the therapeutic efficacy of targeted anticancer drugs such as gefitinib, with reference to EGFR mutations, mechanisms of drug resistance, and the role of pharmacogenomics in personalised medicine. Explain the pharmacogenomics terms responder and non-responder.	4
Q3	In a population of 10000 persons, a base change at a particular locus of a gene was observed among 1000 persons. Give an account for having an SNP or point mutation in this scenario?	4
Q4	Explain the principle of pyrosequencing as a real-time DNA sequencing technique based on 'sequencing by synthesis, including important enzymes and their sources.' Describe in detail the sequence of biochemical reactions involved in the process and discuss its major applications in genomics research.	4
Q5	Discuss the major outcomes of the Human Genome Project with particular emphasis on gene number estimation, genome size, protein-coding gene proportion, and gene density, and explain their biological significance.	4
Q6	Describe the steps involved in a DNA microarray experiment and discuss how gene expression data are analysed (normalisation steps) and interpreted if genome-wide analysis is of cancer vs non-cancerous tissue.	5