JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT
TEST-3 EXAMINATIONS-2023
M. Tech. I Semester (BT)

COURSE CODE (CREDITS): 13M11BT114 (3)

MAX. MARKS: 35

COURSE NAME: HIGH THROUGHPUT TECHNOLOGIES

COURSE INSTRUCTOR: DR. JATA SHANKAR

MAX. TIME: 2 Hours

Note: (a) All questions are compulsory.
(b)Marks are indicated against each question in square brackets.
(c) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems

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Q1. The Phred score is a logarithmic measure of the quality of base calls in DNA sequencing. It is widely used in bioinformatics to assess the accuracy of the sequenced bases, providing a quantitative measure of the likelihood of an error in base calling, if the Phred score is 30, what do you interpret from the sequence data? [5 marks] COI

Q2. How does Illumina sequencing technology fit into the realm of next-generation sequencing, and how does it work to analyze the genome-wide gene expression analysis transcriptomics study? [5 marks] CO I?

Q3. If you have been supported with DNA Microarray facility, how do you carry on to identify the gene expression pattern in drug-resistant *Pseudomonas aeroginosa* in comparison to drug-sensitive *Pseudomonas aeroginosa*? In addition, illustrate the equation to normalize the microarray data? [5 marks] CO I & II

Q4. MALDI-TOF is used to identify the proteins from the given protein clinical or environmental samples. Describe the detail methodology using 'MALDI TOF' to identify the sets of proteins. What are the protein major databases for the protein identification [5 marks] COIII

Q5. Protein-protein interactions (PPIs) are the physical contacts between two or more proteins and they represent complex biological functions. Nowadays, PPIs have been used to construct PPI networks to study complex pathways for revealing the functions of unknown proteins, explain PPI with a suitable example using a protein chip, an invitro assay. [5 marks] CO III

Q6. Notes on the following (2.5 marks each) CO II & III
   a. Metagenomics
   b. Screening of phosphorylated and Glycosylated protein
   c. Characteristics of Protein array
   d. ChiP Seq