

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST-1 EXAMINATIONS-2024

M. Tech. I Semester (BT)

COURSE CODE (CREDITS): 13M11BT114 (3)

MAX. MARKS: 15

COURSE NAME: HIGH THROUGHPUT TECHNOLOGIES

COURSE INSTRUCTOR: DR. JATA SHANKAR

MAX. TIME: 1 Hour

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

Q1. Compare the cost of sequencing the 10 human genomes through Illumina in comparison to the traditional Sanger sequencing technology, considering the value/cost of the human genome project [3 marks] COI

Q2. How does the Single Cell Sequencing technology distinguish the expression of such cells, e.g., cancerous tissues contain heterogenous cells concerning mutations, unique pathology or unique drug response? [3 marks] COI

Q3. How does Illumina sequencing technology fit into the category of next-generation sequencing that includes amplification and sequencing at a single platform of unknown templates? How does it impact gene identification and gene expression analysis in high-throughput studies? [3 marks]

Q4. What do you mean by metagenomics, explain metagenomics with a suitable pipeline considering the human faecal sample [3 marks] COI

Q5 Phred Score determines the quality of sequence determination from the Sanger's or NGS sequencing technologies Calculate the error rate in the given table below for quality score q [3 marks] COII

Quality Score q (Phred Score)	Probability of error	Error rate
10	0.1	?
20	0.01	?
30	0.001	?
40	0.0001	?