

**JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT**

**TEST -1 EXAMINATION- 2025**

**M.Tech - I Semester (BT)**

**COURSE CODE (CREDITS): 13M11BT112 (3)**

**MAX. MARKS: 15**

**COURSE NAME: Advanced Bioinformatics**

**COURSE INSTRUCTORS: Dr. Shikha Mittal**

**MAX. TIME: 1 Hour**

*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	<p>A DNA base call in a sequencing experiment has a Phred quality score (Q) of 30.</p> <p>a. What is the probability (P) that the base call is incorrect?</p> <p>b. If the Phred quality score increases to 40, what is the new probability of an incorrect base call?</p> <p>c. Calculate the Phred quality score if the probability of error is <math>1 \times 10^{-4}</math></p>	(03)																				
Q2	Explain FASTQ format in detail.	(03)																				
Q3.	<p>Consider the following table:</p> <table><tr><th>EmpID</th><th>EmpName</th><th>Salary</th><th>Dept</th></tr><tr><td>1</td><td>John</td><td>5000</td><td>HR</td></tr><tr><td>2</td><td>Mary</td><td>6000</td><td>Finance</td></tr><tr><td>3</td><td>Steve</td><td>5500</td><td>HR</td></tr><tr><td>4</td><td>Anna</td><td>7000</td><td>IT</td></tr></table> <p>a) Find the names of all employees who work in the HR department.</p> <p>b) List all employees who have a salary less than or equal to 5500.</p> <p>c) Find the EmpID and Dept of employees whose salary is between 5000 and 7000.</p>	EmpID	EmpName	Salary	Dept	1	John	5000	HR	2	Mary	6000	Finance	3	Steve	5500	HR	4	Anna	7000	IT	(03)
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1	John	5000	HR																			
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Q4.	<p>Explain the following –</p> <p>a) Difference between first and second generation of sequencing</p> <p>b) Difference between primary key and Foreign key</p> <p>c) Integrity constraints</p>	(06)																				