**JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT**

**TEST -3 EXAMINATIONS- 2025**

**B.Tech-III Semester (BT/BI)**

**COURSE CODE (CREDITS): 25B11BI312** **MAX. MARKS: 35**

**COURSE NAME: Bioinformatics data Management**

**COURSE INSTRUCTORS: Dr. Shikha Mittal** **MAX. TIME: 2 Hours**

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

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



<table>
<tr><th>Q.No</th><th>Question</th><th>CO</th><th>Marks</th></tr>
<tr><td>Q1</td><td>A table stores order details:<br><table><tr><th>OrderID</th><th>ProductID</th><th>ProductName</th><th>SupplierID</th><th>SupplierAddress</th><th>Qty</th></tr><tr><td>O1</td><td>P1</td><td>Pen</td><td>S1</td><td>Delhi</td><td>20</td></tr><tr><td>O1</td><td>P2</td><td>Pencil</td><td>S2</td><td>Mumbai</td><td>10</td></tr></table>Functional dependencies:<br>ProductID → ProductName, SupplierID<br>SupplierID → SupplierAddress<br><br>a. Identify anomalies (insertion, update, deletion).<br>b. Normalize to BCNF.</td><td>[III, IV]</td><td>(5)</td></tr>
<tr><td>Q2</td><td>Explain how strict-2 phase locking is implemented. Show with the example.</td><td>[V]</td><td>(3)</td></tr>
<tr><td>Q3</td><td>Explain in brief –<br>A. ACID properties of a transaction<br>B. Integrity constraints<br>C. Notations used in E-R model<br>D. File storage methods<br>E. Difference between primary key and candidate key</td><td>[I, II, V, VI]</td><td>(10)</td></tr>
<tr><td>Q4</td><td>Consider the following schedule S:<br><table><tr><th>Time</th><th>T1</th><th>T2</th><th>T3</th></tr><tr><td>1</td><td>R1(X)</td><td></td><td></td></tr><tr><td>2</td><td>W1(X)</td><td></td><td></td></tr><tr><td>3</td><td></td><td>R2(X)</td><td></td></tr><tr><td>4</td><td></td><td>W2(X)</td><td></td></tr><tr><td>5</td><td></td><td></td><td>R3(Y)</td></tr><tr><td>6</td><td>R1(Y)</td><td></td><td></td></tr><tr><td>7</td><td></td><td>R2(Y)</td><td></td></tr><tr><td>8</td><td></td><td></td><td>W3(Y)</td></tr><tr><td>9</td><td>W1(Y)</td><td></td><td></td></tr></table>Is the schedule conflict serializable? If yes, find its equivalent serial</td><td>[V]</td><td>(4)</td></tr>
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| | order. | | |
| **Q5** | Explain DBMS architecture and the responsibilities of each component. | [VI] | (3) |
| **Q6** | Explain different types of dependencies used in database normalization. | [III, IV] | (4) |
| **Q7** | **a.** Write an SQL query to create a table Employee with fields: EmpID (Primary key), EmpName, Age, Salary, Department.<br><br>**b.** Insert the following rows into the Employee table<br>(101, 'Ramesh', 28, 35000, 'HR')<br>(102, 'Priya', 32, 45000, 'Finance')<br><br>**c.** Write a query to display employees aged between 25 and 35. | [I, II] | (6) |