Sardar Patel Institute of Technology

Bhavan's Campus, Munshi Nagar, Andheri (West), Mumbai-400058, India

(Autonomous College Affiliated to University of Mumbai)

End Semester Examination
May 2022

Course Name: Data Base Management System
Class: T.Y.BTech
Branch: ETRX/EXTC

Course Code: OEIT4
Max. Marks: 60
Semester: VI

Instruction:
(1) All questions are compulsory
(2) Draw neat diagrams
(3) Assume suitable data if necessary
(4) Mention the question number clearly while writing the answer

<table>
<tr><th>QNo</th><th>Question</th><th>Marks</th><th>CO</th></tr>
<tr><td>1a</td><td>Define 1NF,2NF,3NF, BCNF.
Convert the following table up to 2NF.
<table>
<tr><th>Customer ID</th><th>Store ID</th><th>Warehouse Location</th></tr>
<tr><td>101</td><td>101</td><td>Pune</td></tr>
<tr><td>101</td><td>306</td><td>Delhi</td></tr>
<tr><td>204</td><td>101</td><td>Pune</td></tr>
<tr><td>306</td><td>204</td><td>Mumbai</td></tr>
<tr><td>401</td><td>306</td><td>Delhi</td></tr>
</table></td><td>4

6</td><td>CO3</td></tr>
<tr><td>b</td><td>Consider the given relation
R (A, B,C,D)
With FD: (A→B, B→C, C→D)
1. Find Candidate Key
2. Find Prime Attributes
3. Find Non-Prime Attributes
OR
Describe the following Inference Rules for FD.
1. Reflexive
2. Augmentation
3. Transitive
4. Decomposition
5. Union</td><td>5</td><td>CO3</td></tr>
</table>

<table>
<tr><td>2a</td><td>Consider the following partial Schedule S involving two transactions T1 and T2. Only the read and the write operations have been shown. The read operation on data item X is denoted by read(X) and the write operation on data item X is denoted by write(X).
<table><tr><td></td><td>T1</td><td>T2</td></tr><tr><td>1</td><td>R(A)</td><td></td></tr><tr><td>2</td><td>W(A)</td><td></td></tr><tr><td>3</td><td></td><td>R(A)</td></tr><tr><td>4</td><td></td><td>W(A)</td></tr><tr><td>5</td><td></td><td>R(B)</td></tr><tr><td>6</td><td></td><td>W(B)</td></tr><tr><td>7</td><td></td><td>COMMIT</td></tr><tr><td>8</td><td>R(B)</td><td></td></tr></table>Answer the Following with Justification.
1. Is given schedule follow Strick Two Phase Locking Protocol.
2. Is given schedule recoverable if fail at step 7.</td><td>04</td><td>CO4</td></tr>
<tr><td>b</td><td>Convert the given schedule into equivalent serial schedule?
<table><tr><td>T_1</td><td>T_2</td><td>T_3</td><td>timestamp</td></tr><tr><td></td><td></td><td>R(Y)</td><td>t_1</td></tr><tr><td></td><td></td><td>R(Z)</td><td>t_2</td></tr><tr><td>R(X)</td><td></td><td></td><td>t_3</td></tr><tr><td>W(X)</td><td></td><td></td><td>t_4</td></tr><tr><td></td><td></td><td>W(Y)</td><td>t_5</td></tr><tr><td></td><td></td><td>W(Z)</td><td>t_6</td></tr><tr><td></td><td>R(Z)</td><td></td><td>t_7</td></tr><tr><td>R(Y)</td><td></td><td></td><td>t_8</td></tr><tr><td>W(Y)</td><td></td><td></td><td>t_9</td></tr><tr><td></td><td>R(Y)</td><td></td><td>t_{10}</td></tr><tr><td></td><td>W(Y)</td><td></td><td>t_{11}</td></tr><tr><td></td><td>R(X)</td><td></td><td>t_{12}</td></tr><tr><td></td><td>W(X)</td><td></td><td>t_{13}</td></tr></table></td><td>06</td><td>CO4</td></tr>
<tr><td>c</td><td>Prove the following with respect to query processing.
1. Selection operations are commutative
2. If more than one projection operation is used in expression, then only outer projection operation is required.</td><td>05</td><td>CO4</td></tr>
<tr><td>3a</td><td>Write SQL query for the following relational schema.

Customer (<u>Cid</u>, name, age, city)
Product (<u>Pid</u>, name, quantity, price)
Buy (Cid, Pid, date_of_purchase)

1. Find details of all customers belongs to city “Mumbai”</td><td>10</td><td>CO2</td></tr>
</table>

	2. Find name of customer who brought product "Chair" on 12/4/2021. 3. Delete a record of product having quantity less than 10. 4. Find total price of all products. 5. Modify the city details of customer "Mr.Giri" to "Pune"		
b	Consider the following relational schema. Account (Acc_No, Type, Balance) Write a trigger to increase balance with 10% to all account holders.	5	CO2
4a	List and discuss the purpose of each component of Disk storage of DBMS system structure. OR Describe any five database users in details	5	CO1
b	Draw an ER model for University database consisting information of student, Department, Faculty, course, Exam, grade. Faculty must belong to department and faculty can teach multiple courses. Each course is taught by only one faculty, Each student will get grade for the course he/she enrolled.	10	CO1