



## Sardar Patel Institute of Technology

Bhavan's Campus, Munshi Nagar, Andheri(West), Mumbai 400058-India  
(An Autonomous Institute Affiliated to University of Mumbai)

### End Semester Examination

Max. Marks: 60  
Class: FYMCA  
Course Code: MC502  
Course: Database Management System

Duration: 2.15  
Semester: I  
Date: 14/5/22  
Time: 2:30 to 4:45

#### Instructions:

- (1) All Questions are Compulsory.
- (2) Draw neat diagrams.
- (3) Assume suitable data if necessary.

No	Question	Max. Marks	CO	BL																												
Q1 A	Design an ER diagram for Blood Bank Management System by mentioning all the steps.  OR Design an ER diagram for Residential Society Management System by mentioning all the steps.	8	1	3																												
Q1 B	Apply Normalization concept to identify the candidate keys from following functional dependencies by enlisting all the steps. $R(A,B,C,D,E) \quad F = ( A \rightarrow B, B \rightarrow C, C \rightarrow D, D \rightarrow E, E \rightarrow A )$	7	2	3																												
Q2 A	Illustrate the concept of varray with the help of an example.  OR Illustrate Parallel Database architecture types with the help of an example.	6	4	2																												
Q2 B	Apply decomposition property and identify following relation is functionally preserved or not. Justify your answer. $R(A,B,C,D,E)$ and $F = \{ A \rightarrow B, B \rightarrow C, C \rightarrow D, D \rightarrow A \}$ and $R_1(A,B,C)$ and $R_2(C,D,E)$	6	2	3																												
Q2 C	Illustrate the concept of Mandatory Access Control with the help of an example.	3	4	2																												
Q3 A	Illustrate the use of Fragmentation. Write a query and show the output of Horizontal and Vertical Fragmentation for the following relation. Consider column Department for Horizontal Fragmentation and column Empid for Vertical Fragmentation. <table><tr><th>Empid</th><th>Ename</th><th>Salary</th><th>Department</th></tr><tr><td>101</td><td>Sagar</td><td>10000</td><td>Sales</td></tr><tr><td>102</td><td>Rahul</td><td>20000</td><td>Marketing</td></tr><tr><td>103</td><td>Raj</td><td>30000</td><td>IT</td></tr><tr><td>104</td><td>Ritika</td><td>40000</td><td>IT</td></tr><tr><td>105</td><td>Harsh</td><td>50000</td><td>Sales</td></tr><tr><td>106</td><td>Kavya</td><td>60000</td><td>Sales</td></tr></table>	Empid	Ename	Salary	Department	101	Sagar	10000	Sales	102	Rahul	20000	Marketing	103	Raj	30000	IT	104	Ritika	40000	IT	105	Harsh	50000	Sales	106	Kavya	60000	Sales	6	4	2
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Q3 B	Consider the following example of a log of three transactions, where deferred database modification scheme is used. If a crash occurs just after step 9 and the recovery of the system is successfully completed. Analyze the following example and perform the operations. <table><tr><th>Step</th><th>Details of Log</th></tr><tr><td>1</td><td>&lt;T0 Start&gt;</td></tr><tr><td>2</td><td>&lt;T0,A,100,200&gt;</td></tr><tr><td>3</td><td>&lt;T0,A,200,300&gt;</td></tr><tr><td>4</td><td>&lt;T1,Start&gt;</td></tr><tr><td>5</td><td>&lt;T0 Commit&gt;</td></tr><tr><td>6</td><td>&lt;T1,B,500,400&gt;</td></tr><tr><td>7</td><td>&lt;T1,Commit&gt;</td></tr><tr><td>8</td><td>&lt;T2, Start&gt;</td></tr><tr><td>9</td><td>&lt;T2,A,300,1500&gt;</td></tr></table>	Step	Details of Log	1	<T0 Start>	2	<T0,A,100,200>	3	<T0,A,200,300>	4	<T1,Start>	5	<T0 Commit>	6	<T1,B,500,400>	7	<T1,Commit>	8	<T2, Start>	9	<T2,A,300,1500>	6	3	4
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Q3 C	Test whether following is Recoverable schedule or not? Justify your answer. S: R1(A), W1(A), R2(A), R2(B), W1(B), R2(A), W1(A), R2(B), C1, C2	3	3	4																				
Q4 A	Consider the University database given below. The primary keys are underlined and the data types are specified. Student ( <u>snum</u> :number, sname:string, major:string, level:string, age:number) Class ( <u>cname</u> :string, meet_at:number, room:number not null, fid:number) Enrolled (snum:number, cname:string) a) Create the above tables by properly specifying the primary keys and the foreign keys and named constraints. b) Enter atleast two tuples for each relation. c) Write SQL query to display Student details who is in class FYMCA. d) Write SQL query to drop all the constraints defined on Student relation	8	5	3																				
Q4 B	Write a PL/SQL procedure to find factorial of a given number.	4	6	3																				
Q4 C	Write a PL/SQL code to raise an exception if the age of the student being inserted is greater than 25.	3	6	3																				