Set - C

K. J. Somaiya Institute of Technology, Sion, Mumbai-22
(Autonomous College Affiliated to University of Mumbai)

Nov – Dec 2024	
(B. Tech) Program: Computer Engineering Scheme : III	
DSY Regular Examination: SY Semester: III	
Course Code: C303 and Course Name: Database Management System	
Date of Exam: 20/12/12 Duration: 02.5 Hours	Max. Marks: 60

Instructions:
(1) All questions are compulsory.
(2) Draw neat diagrams wherever applicable.
(3) Assume suitable data, if necessary.

Q. No.	Question	Max. Marks	CO	BT level
Q 1	Solve any **two** questions out of three: (05 marks each)	10		
a)	What is data independence with respect to DBMS? Also explain the difference between logical and physical data independence.		CO1	U
b)	Explain Generalization and Specialization with overlapping and completeness constraints using suitable examples.		CO2	U
c)	Identify the minimum number of relations required to represent the given ER diagram and also Convert the given ER diagram into equivalent relational schema diagram.		CO3	AP
Q 2	Solve any **two** questions out of three: (05 marks each)	10		
a)	Consider given relation R(A,B,C,D,E,F) having set of FD's: $A \to B$, $A \to C$, $C \to D$, $B \to E$, $AC \to F$, Calculate attribute closures $\{A\}+$, $(B)+$ and $\{AC\}+$ along with all possible candidate keys		CO5	AP

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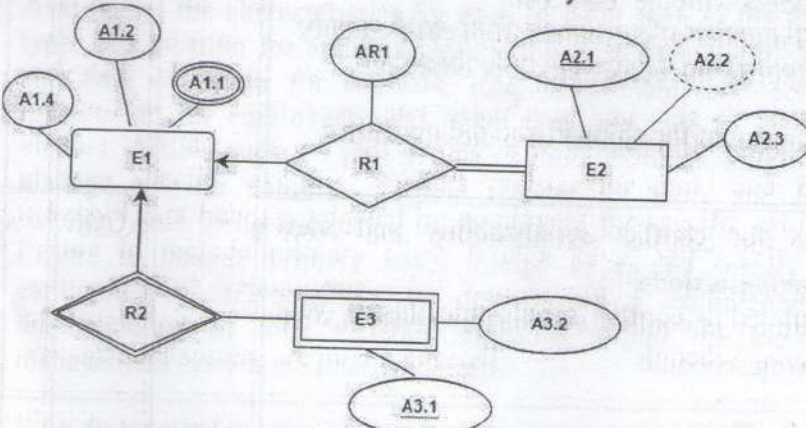Course Code: C303   and   Course Name: Database Management System

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b)	Explain different types of constraints in SQL with syntax and suitable examples.		CO4	U
c)	Explain locking protocol with example		CO6	U
Q.3	Solve any **two** questions out of three. (10 marks each)	20		
a)	Describe the different types of keys in the Relational Model. Explain the importance of primary, foreign, and candidate keys in maintaining data integrity.		CO3	U
b)	Product(p_id, p_name, unit_cost) Customer(c_id, c_name, email, country) shipper(s_id, s_name, country) Order(o_id, p_id, quantity) Shipped_order(o_id, c_id, s_id, date) Write sql query for following: 1. Write a table statement for **Shipped_order** with identified primary key and foreign keys. 2. Find **Id**s of all orders placed by 'John' 3. Find the details product with the least cost. 4. Determine the total number of customers from each country and arrange the countries in decreasing order based on customer count. 5. Find Name and country of the shipper who did not ship a single order.		CO4	AP
c)	Explain the conditions for conflict serializability and view serializability in database transactions. Determine if the schedule S1 is conflict serializable. Justify your answer. Given the following schedule:		CO6	AP

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T1	T2	T3			
R(A)					
W(A)					
		W(C)			
	R(B)				
		R(B)			
R(C)					
		R(A)			
		W(A)			
R(A)					
	W(B)				
W(C)					

Q.4	Solve any **two** questions out of three. (10 marks each)	20			
a)	**Construct an ER model** which should include different types of attributes, Relations ,Cardinality Constraint ,Participation Constraint . **For a Museum Management System**, database should model information about Exhibit, Artifact, Employee, Visitor, and Tour. Also model the characteristics for each of them such as the name, type, and location for exhibits; description, historical significance, and date of origin for artifacts; role, department, and contact information for employees; and ticket type and date of visit for visitors. Artifacts can be part of one or more exhibits. Employees manage specific exhibits. Visitors register for tours and book tickets. Tours being conducted by employees for specific exhibits. Ensure to include primary keys, foreign keys, and specify the cardinality of relationships to demonstrate a comprehensive understanding of how different elements within the museum management system are interconnected.		CO2	AP
b)	Why do we need normalization? Explain the concept of 1NF, 2NF, 3NF, BCNF with suitable examples.		CO5	U
c)	Write short note on the following: i)ACID Properties of transaction ii)Explain the following Relational Algebra Operators with syntax and example : Selection, Projection, Union, Cross product		CO3 CO6	U

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