Set -3

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

Jan/Feb ~~Nov – Dec~~ 2025
B. Tech Program: Computer Engineering Scheme : III
Supplementary ~~Regular~~ Examination: SY Semester: III
Course Code: CEC303 and Course Name:Database Management System
Date of Exam: ~~29/11/2025~~ 03/02/26 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)	Differentiate between File system and Database System		CO1	U
b)	Consider following table schema Employee(EmpId, Name, DeptId, Salary) Department(DeptId, DeptName, ManagerId) Project(ProjId, ProjName, DeptId) WorksOn(EmpId, ProjId, Hours) Solve following queries using **relational algebra operators** i.) List names of employees in DeptId = 10 ii.) List EmpId and Name of employees with salary > 50000 iii.) List the Employees who do **not** work on any project iv.) Give the detail of project,which is handle by sales department v.) List the Managers' names and their department names(assume ManagerId references Employee.EmpId)		CO3	Ap
c)	Consider given relation R(A,B,C,D,E,F) having set of FD's: A→B, A→C, C→D, B→E,AC→F Calculate attribute closures {A}+, (B}+ and {AC}+ along with all possible candidate keys		CO5	Ap
Q 2	Solve any **two** questions out of three: (05 marks each)	10		
a)	Explain constraints associated with specialization in an EER model with suitable examples.		CO2	U
b)	Explain all Aggregate functions in SQL with syntax and example		CO4	U
c)	Explain state transition diagram with diagram		CO6	U
Q.3	Solve any **two** questions out of three. (10 marks each)	20		

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a)	Draw the ER diagram for given problem statement A salesperson may manage many other salespeople. A salesperson is managed by only one salespeople. A salesperson can be an agent for many customers. A customer is managed by one salespeople. A customer can place many orders. An order can be placed by one customer. An order lists many inventory items. An inventory item may be listed on many orders. An inventory item is assembled from many parts. A part may be assembled into many inventory items. Many employees assemble an inventory item from many parts. A supplier supplies many parts. A part may be supplied by many suppliers ER Diagram should include: 1. Different types of attributes (2M) 2. Relations (2M) 3. Participation Constraints(3M) 4. Cardinality Constraints(3M)		CO2	Ap
b)	Consider the following database schema: Employee(eid,ename,street,city) Works(eid,cid,salary) company(cid,cname,city) Write SQL queries for the following database. (2M each) 1) Modify database so that Jack now lives in "Mumbai" 2) Give all employees of "ANZ' corporation a 10% raise in salary 3) Find all employee id who live in the same cities as the company for which they work. 4) Give total number of employees 5) Find highest paid employee		CO4	Ap
c)	i) Explain View with syntax and example ii) Write a note Deadlock Handling		CO4 CO6	U
Q.4	Solve any **two** questions out of three. (10 marks each)	20		
a)	Convert given Relation R(A,B,C,D,E,F,G,H,I,J) into highest normal form. FD's are AB→C,C—>EF,AD→GH,G→I,H→J		CO5	Ap

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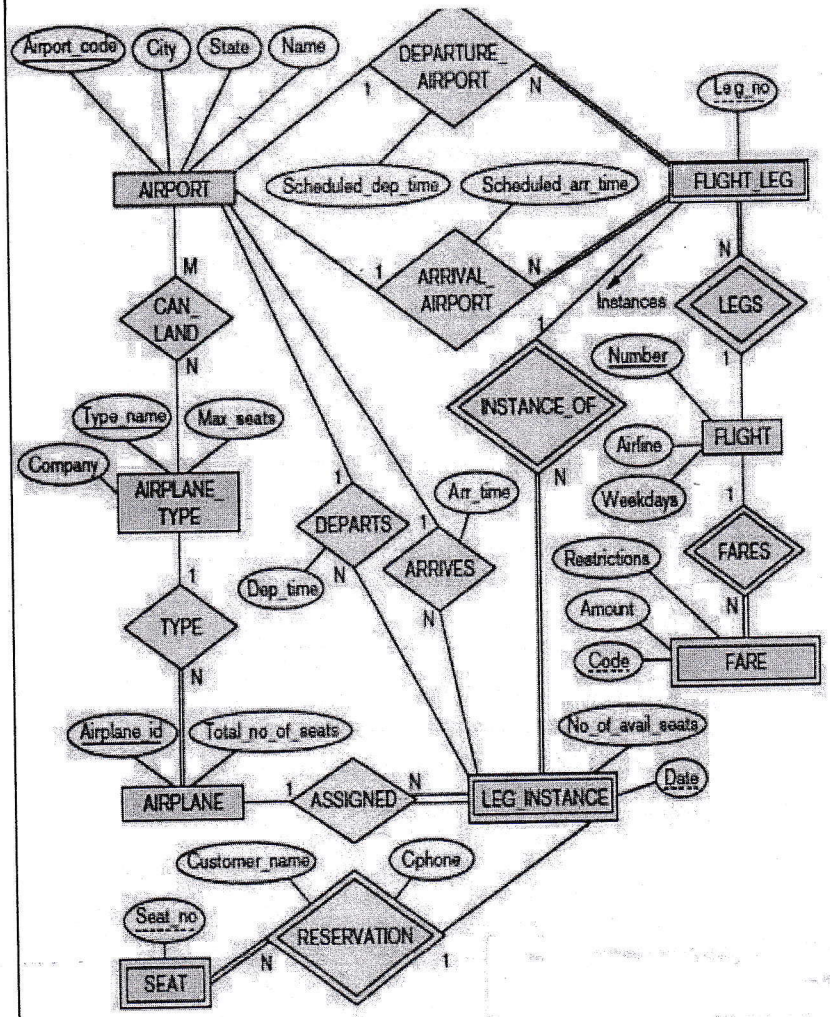
b)	Convert below ER diagram into relational model by applying all 7 steps of Codd's Rule: 		CO3	Ap
c)	A given schedule has transactions T1,T2,T3 as given below **Solve the following.** i.) Draw the Precedence Graph ii.) Is schedule conflict serializable or not? Find respective serial schedule iii.) Is the below schedule view serialisable or not?		CO6	Ap

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T1	T2	T3
r(x)		
	r(z)	
r(z)		
		r(x)
		r(y)
w(x)		
		w(y)
	r(y)	
	w(z)	
	w(y)	

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