

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

Subject Code: ITC303 Subject Name: Database management system

Date: 27.01.2023

Jan - Feb 2023 (B.Tech.) Program: Information Technology Examination: SY Semester: III Course Code: ITC303 and Course Name: Database Management System Duration: 2.5 Hours <span style="float: right;">Max. Marks: 60</span>				
Instructions: (1) All questions are compulsory. (2) Draw neat diagrams wherever applicable. (3) Assume suitable data, if necessary.				
	Question	Max. Marks	CO	BT Level
QU-1	Solve any <b>SIX</b> questions out of eight:	<b>12</b>		
i)	Define a Database. List two advantages of a Database System.	2	CO1	1
ii)	Consider the RA expression $\prod_{ID, Name, CourseID} (Student \bowtie Takes)$ and explain in words what the expression does.	2	CO3	2
iii)	State the reasons why you will use NULL in Database.	2	CO4	1
iv)	Explain the derived attribute with a suitable example.	2	CO2	2
v)	Describe in short the use of Indexing in a database.	2	CO4	2
vi)	Explain Referential Integrity Constraint in SQL.	2	CO4	2
vii)	What is normalization?	2	CO5	1
viii)	What are the problems of concurrent execution of transactions?	2	CO6	2
QU-2	Solve any <b>FOUR</b> questions out of six.	<b>16</b>		
i)	Discusses the differences between a file-processing system and a DBMS.	4	CO1	2
ii)	Define attribute. What are the types of attributes? Explain multivalued attributes with suitable examples.	4	CO2	2
iii)	List the mapping rules of ER and illustrate the mapping of a weak entity with a suitable example.	4	CO3	2
iv)	List and explain the Aggregate functions in SQL.	4	CO4	3
v)	What is a functional dependency? Explain the role of functional dependencies in the process of normalization.	4	CO5	2
vi)	Explain Log Based Recovery with a suitable example.	4	CO6	2
QU-3	Solve any <b>TWO</b> questions out of three.	<b>16</b>		



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i)	Explain Data Abstraction and Data Independence with suitable examples.	8	CO1	2
ii)	<p><i>employee</i> (<u>employee_name</u>, street, city) <i>works</i> (<u>employee_name</u>, company_name, salary) <i>company</i> (<u>company_name</u>, city) <i>manages</i> (<u>employee_name</u>, manager_name)</p> <p>Figure-1: Employee Database.</p> <p>Consider the Employee Database of Figure 1, where the primary keys are underlined. Give an expression in SQL for each of the following queries.</p> <p>a. Find the names and cities of residence of all employees who work for "Vaidehi Enterprises".</p> <p>b. Find the names, street addresses, and cities of residence of all employees who work for "Dena Bank" and earn more than Rs. 10,000.</p> <p>c. Find all employees in the database who do not work for "State Bank of India".</p> <p>d. Find all employees in the database who earn more than each employee of "Dena Bank".</p>	8	CO4	3
iii)	Why is a table whose primary key consists of a single attribute automatically in 2NF when it is in 1NF? Discuss with a suitable example.	8	CO5	2
QU-4	Solve any <b>TWO</b> questions out of three.	16		
i)	Explain Generalization and Specialization with a suitable example.	8	CO2	2
ii)	Explain the Conflict Serializability with a suitable example.	8	CO6	2
iii)	List and explain the Relational Algebra Operations.	8	CO3	2

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