

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

**End Semester Exam**

Nov – Dec 2021

**(B. Tech) Information Technology**

Examination: SYIT Semester: III

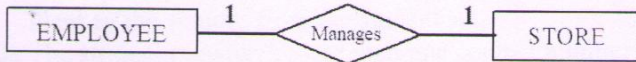
Course Code: **1UITC303** and Course Name: **Database Management System**

Duration: 03 Hours

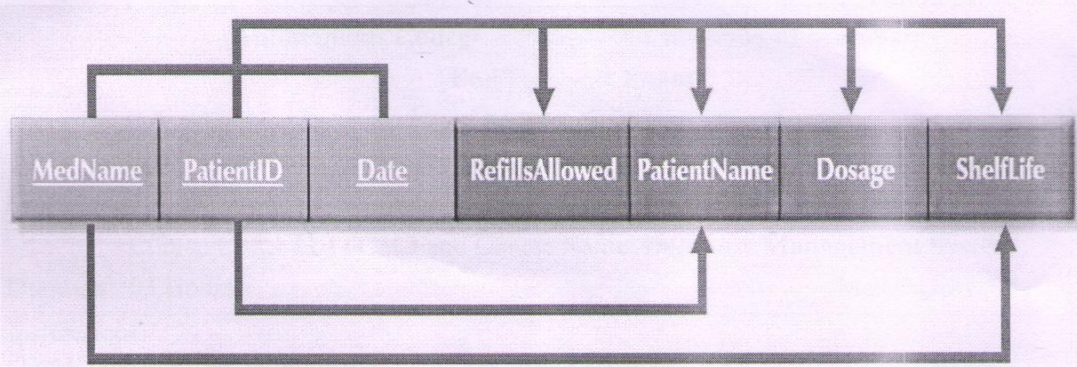
Max. Marks: 60

**Instructions:**

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

		Max. Marks	CO	BT Level
<b>Qu-1</b>	Solve any <b>Six</b> questions out of <b>Eight</b> .	<b>12</b>		
<b>i)</b>	What is data redundancy and which characteristics of the file system can lead to it?	<b>2</b>	CO1	Remember
<b>ii)</b>	 <p align="center">Figure-1: Relationship depiction-The ERD.</p> <p>Describe the relationship shown in the figure-1.</p>	<b>2</b>	CO2	Understand
<b>iii)</b>	Apply the mapping rules of the ER model to Relational Model and convert the ER diagram shown in figure-1 to relational model.	<b>2</b>	CO3	Apply
<b>iv)</b>	Why entity integrity important in a database?	<b>2</b>	CO3	Remember
<b>v)</b>	How do we create table using SQL statement?	<b>2</b>	CO4	Remember
<b>vi)</b>	What is a derived attribute? Give an example.	<b>2</b>	CO2	Remember
<b>vii)</b>	What is normalization?	<b>2</b>	CO5	Remember
<b>viii)</b>	What is a transaction log and what is its function?	<b>2</b>	CO6	Remember
<b>Qu-2</b>	Solve any <b>Four</b> questions out of <b>Six</b> .	<b>16</b>		
<b>i)</b>	List and discuss the four transaction properties.	<b>4</b>	CO6	Understand
<b>ii)</b>	What is a weak entity and how it is represented in an ER diagram? Give an example.	<b>4</b>	CO2	Understand
<b>iii)</b>	List and explain binary relational algebra operations with suitable example.	<b>4</b>	CO3	Understand
<b>iv)</b>	It is said that file system lacks data independence. Discuss.	<b>4</b>	CO1	Understand
<b>v)</b>	What three data anomalies are likely to be the result of data redundancy? How can such anomalies be eliminated?	<b>4</b>	CO5	Remember

vi)	<p>Consider the following relations:  CUSTOMER (CUST_NO, SALES_PERS_NO, CITY)  SALESPERSON (SALES_PERS_NO, FNAME,  COMM_PERC, YEAR_OF_HIRE)</p> <p>With reference to the above relations write the following queries:</p> <ol style="list-style-type: none"> <li>Find the salespersons record for Anita.</li> <li>Find the customers record for all customers at Pune.</li> <li>List the names of salespersons working since 2019.</li> <li>Print a list of customers by CUST_NO and CITY for which salesperson Abhijit is responsible.</li> </ol>	4	CO4	Apply
<b>Qu-3</b>	Solve any <b>Two</b> questions out of <b>Three</b> .	<b>16</b>		
i)	Suppose that your database system has failed. Describe the database recovery process and the use of deferred update protocol.	8	CO6	Understand
ii)	Explain the functionality of query processor and storage manager considering the system structure.	8	CO1	Understand
iii)	<p>Write the SQL code that will create the STUDENT relation:  STUDENT (Rollno, Fname, Sname, Emailid, ContactNo)</p> <ol style="list-style-type: none"> <li>No duplicate values for Rollno and is used to uniquely identify the student from the student set.</li> <li>The student may have more than one contact number but a single email id assigned by college.</li> <li>Now consider students' addresses having values of Street, City and PIN that also need to be stored in the database. Change the schema to accommodate the student address.</li> <li>The student age needs to be computed without storing it directly, modify the student schema.</li> <li>Modify the schema, if, each student enrolls for a course which has a unique courseid and registers him/herself in a single department.</li> </ol>	8	CO4	Apply
<b>Qu-4</b>	Solve any <b>Two</b> questions out of <b>Three</b> .	<b>16</b>		
i)	<p>Attempt the following:</p> <ol style="list-style-type: none"> <li>What is key? Explain various types of keys in relational data models.</li> <li>Discuss the role of NULL in relational databases.</li> </ol>	8	CO3	Understand
ii)	The dependency diagram in <b>Figure-2</b> indicates that a patient can receive many prescriptions for one or more medicines over time. Based on the dependency diagram, apply normalization process and give database whose tables are in at least 2NF, showing the dependency diagram for each table.	8	CO5	Apply
iii)	Draw an ER diagram for Hospital Management System considering doctor, patient, hospital, supporting-staff and services as the major entities. Assume attributes and relationships between these entities and clearly state the reason for considering the same.	8	CO2	Apply



**Figure-2:** Prescription Dependency Diagram.