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
Qu-1	Solve any **Six** questions out of **Eight**.	12		
i)	Explain projection operation in relational algebra.	2	CO3	U
ii)	Explain role of DBA.	2	CO1	U
iii)	Define Specialization and Aggregation.	2	CO2	U
iv)	Discuss role of foreign key in Database management system.	2	CO4	A
v)	Explain nested queries with help of example.	2	CO4	U
vi)	Define Normalization & functional dependency.	2	CO5	U
vii)	Discuss Concurrency Control in DBMS.	2	CO6	U
viii)	Discuss role of GRANT & REVOKE.	2	CO5	U
Qu-2	Solve any **Four** questions out of **Six**.	16		
i)	With reference to following schema write relational algebra queries. student (id, name) enrolled_in(id, code) subject (code, lecturer) 1. What are the names of students enrolled in cs3020? 2. Which subjects is Hector taking? 3. Who teaches cs1500? 4. Who teaches cs1500 or cs3020? **Note: Assume suitable dataset.**	4	CO3	A
ii)	Suppose you are given the following requirements for a simple database of National Cricket Trophy • The NCT has many teams • Each team has name, a city ,a coach, a captain and set of players • Each player belongs to only one team • Each player has a name, a position (like left wing, golie),	4	CO2	A

		• a skill level and set of injury record • Game is played between two team Construct ER diagram for NCT database.			
iii)		Compare traditional file system with DBMS.	4	CO1	U
iv)		Consider the following employee database Employee(empname,street,city,date_of_joining) Works(empname,company_name,salary) Company(company_name,city) Manages(empname,manage_name) Write SQL queries for the following statements 1.Modify the database so that empyee "Parth" now leaves in Mumbai 2.Find number of employees in each city with date_of_joinining as 10 July 1992 3.list name of companies starting with letter "A" 4.Display empname,manager_name,street,city only for employee having manager **Note: Assume suitable dataset.**	4	CO4	A
v)		Explain Normalization process.	4	CO5	U
vi)		Explain Log Based Recovery.	4	CO6	U
Qu-3		Solve any **Two** questions out of **Three**.	16		
i)		Explain mapping for ER to Relational Model with the help of example.	8	CO3	A
ii)		Consider following Schema for College Library Student (Roll_No,Name,Branch) Book (ISBN,Title,Author,Publisher) Issue (Roll_no,ISBN,Date_of_Issue) Write a SQL Queries for the following Statements 1.List Roll Number and Name of all students of the branch IT. 2.Find the name of students who have issued a book published by 'XYZ' publisher. 3.List title of all book and their author issued by student 'Alice' 4.List title of all books issued on or before July 20,1990 **NOTE: Assume suitable dataset**	8	CO4	A
iii)		Explain Data Abstraction & data Independence.	8	CO1	U
Qu-4		Solve any **Two** questions out of **Three**.	16		
i)		Explain Two-Phase Locking Protocol.	8	CO6	U
ii)		A university wants to set up a database to record details about its staff, and the departments they belong to. They intend to record the following information. • For each member of staff, their staff identity number, name, job title, and salary. • For each department, its name and address. • For each member of staff, all departments that they belong to. It is required that every member of staff belongs to at least one department.	8	CO2	A

	• For each department, the head of department. It is required that each department has exactly one head of department. **Build an ER diagram** that expresses the requirements for the database. Make sure that you capture all the constraints on the data mentioned above.			
iii)	Identify need of Normalization. Given a relation R(P, Q, R, S, T, U, V, W, X) and Functional Dependency set FD = { PQ → R, QS → TU, PS → VW, and P → X }, determine the given R is in which normal form?	8	CO5	A