

Model Question Paper-1 with effect from 2019-20 (CBCS Scheme)

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**Fifth Semester B.E. Degree Examination
DATABASE MANAGEMENT SYSTEMS**

TIME: 03 Hours

Max. Marks: 100

Note: 01. Answer any **FIVE** full questions, choosing at least **ONE** question from each **MODULE**.

Module – 1			Marks
Q.1	(a)	Explain the components of DBMS and their interaction with the help of a neat diagram.	10
	(b)	Describe various disadvantages of file system compare to Data base management system.	5
	(c)	What is the difference between controlled and uncontrolled redundancy? Illustrate with examples.	5
OR			
Q.2	(a)	Define the following terms: Data Model, Database Schema, Database State, Conceptual Schema, Data Independence, DDL and DML	7
	(b)	Describe the three-schema architecture. Why do we need mappings between schema levels?	8
	(c)	What is an entity type? What is an entity set? Explain the differences among an entity, an entity type, and an entity set	5
Module – 2			
Q.3	(a)	Discuss the various types of inner join operations.	6
	(b)	Draw an ER diagram for HOSPITAL Management system with the following PATIENTS(Pssn, Lastname, Firstname, PhoneNo, Sex, DOB, Address) DOCTORS(Dssn, Lastname, Firstname, PhoneNo, Sex, DOB, Address) BEDS(RoomNo, BedNo, Type, Status, Price) ACCOUNTS(DateIn, DateOut, Amount) Show all the types of Entities and Attributes. Assume your own Relationships, Participation constraints and Cardinality ratios with explanation.	10
	(c)	Discuss the entity integrity and referential integrity constraints. Why is each considered important?	4
OR			
Q.4	(a)	How are the OUTER JOIN operations different from the INNER JOIN operations?	6
	(b)	Consider the following relations for a database that keeps track of student enrollment in courses and the books adopted for each course: STUDENT(SSN, Name, Major, Bdate) COURSE(Course#, Cname, Dept) ENROLL(SSN, Course#, Quarter, Grade) BOOK_ADOPTION(Course#, Quarter, Book_ISBN) TEXT(Book ISBN, BoolTitle, Publisher, Author) Specify the following queries in relational algebra on the database schema given a. List the number of courses taken by all students named 'John Smith' in Winter 1999 (i.e., Quarter = 'W99'). b. Produce a list of textbooks {include Courses, BookISBN, Book, Title} for courses offered by the 'CS' department that have used more than two books.	10

	c. List any department that has all its adopted books published by 'AWL Publishing'. d. List the course which has more than three textbooks. e. List the names of the students who has enrolled in more than one courses.	
(c)	What is the difference between a key and a super key?	4

Module – 3

Q.5	(a) What do you mean by terms Aggregation and Generalization? Explain it with the help of example.	6
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(b)	<p>Consider the two tables T1 and T2 shown. Show the results of the following operations:</p> <p align="center">TABLE 1</p> <table border="1"> <thead> <tr> <th>P</th> <th>Q</th> <th>R</th> </tr> </thead> <tbody> <tr> <td>10</td> <td>a</td> <td>5</td> </tr> <tr> <td>15</td> <td>b</td> <td>8</td> </tr> <tr> <td>25</td> <td>A</td> <td>6</td> </tr> </tbody> </table> <p align="center">TABLE 2</p> <table border="1"> <thead> <tr> <th>A</th> <th>B</th> <th>C</th> </tr> </thead> <tbody> <tr> <td>10</td> <td>B</td> <td>6</td> </tr> <tr> <td>25</td> <td>C</td> <td>3</td> </tr> <tr> <td>10</td> <td>B</td> <td>5</td> </tr> </tbody> </table> <p>a. $T1 \bowtie_{T1.P = T2.A} T2$ b. $T1 \bowtie_{T1.Q = T2.B} T2$ c. $T1 \bowtie_{T1.P = T2.A} T2$ d. $T1 \bowtie_{T1.Q = T2.B} T2$ e. $T1 \cup T2$ f. $T1 \bowtie_{(T1.P = T2.A \text{ AND } T1.R = T2.C)} T2$</p>	P	Q	R	10	a	5	15	b	8	25	A	6	A	B	C	10	B	6	25	C	3	10	B	5	10
P	Q	R																								
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25	C	3																								
10	B	5																								
(c)	How Triggers and assertions are defined?	4																								

OR

Q.6	<p>(a) Consider the Movie database: MOVIE(<u>Title</u>,Director,Movieyear,Rating) ACTORS(<u>Actor</u>,Age) ACTS(<u>Actor</u>,<u>Title</u>) DIRECTORS(<u>Director</u>,DirectorsAge) Write the following queries using SQL i) List the movies directed by “ STEVEN ” after 2018 ii) List all the actors who are over 40 year old and worked in all movies directed by “JOHN”. iii) Find an actor who was casted in “maxim” movie. iv) Find director and actor of the movie whose title starts with letter “A”. v) List all female actresses.</p>	10
(b)	Describe the concept of a cursor and how it is used in embedded SQL.	5
(c)	What is the impedance mismatch problem? Which of the three programming approaches minimizes this problem?	4

Module – 4

Q.7	(a) What do you mean by Normalization? Explain 2NF and BCNF with a suitable example.	8
(b)	Write a trigger in SQL to call a stored procedure INFORM_SUPERVISOR() whenever a new record is inserted or updated , check whether an employee’s salary is greater than the salary of his/her direct supervisor in the COMPANY database	8
(c)	What is view? Can we update the view? Discuss	4

OR

Q.8	(a)	Which Normal form is based on the concept Transitive Dependency? Explain with an example.	5																																				
	(b)	Consider the following two sets of functional dependencies: $F = \{A \rightarrow C, AC \rightarrow D, E \rightarrow 7AD, E \rightarrow H\}$ and $G = \{A \rightarrow CD, E \rightarrow AH\}$. Check whether they are equivalent.	5																																				
Q.9	(c)	Normalize the below relation up to 3NF <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Module</th> <th>Dept</th> <th>Lecturer</th> <th>Text</th> </tr> </thead> <tbody> <tr> <td>M1</td> <td>D1</td> <td>L1</td> <td>T1</td> </tr> <tr> <td>M1</td> <td>D1</td> <td>L1</td> <td>T2</td> </tr> <tr> <td>M2</td> <td>D1</td> <td>L1</td> <td>T1</td> </tr> <tr> <td>M2</td> <td>D1</td> <td>L1</td> <td>T3</td> </tr> <tr> <td>M3</td> <td>D1</td> <td>L2</td> <td>T4</td> </tr> <tr> <td>M4</td> <td>D2</td> <td>L3</td> <td>T1</td> </tr> <tr> <td>M4</td> <td>D2</td> <td>L3</td> <td>T5</td> </tr> <tr> <td>M5</td> <td>D2</td> <td>L4</td> <td>T6</td> </tr> </tbody> </table>	Module	Dept	Lecturer	Text	M1	D1	L1	T1	M1	D1	L1	T2	M2	D1	L1	T1	M2	D1	L1	T3	M3	D1	L2	T4	M4	D2	L3	T1	M4	D2	L3	T5	M5	D2	L4	T6	10
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Module – 5																																							
Q.9	(a)	Explain LOST UPDATE, DIRTY READ and BLIND WRITE.	6																																				
	(b)	Check whether the below schedule is conflict serializable or not $\{b2, r2(X), b1, r1(X), w1(X), r1(Y), w1(Y), w2(X), e1, c1, e2, c2\}$	7																																				
	(c)	With neat diagram, Explain the various states of transaction execution.	7																																				
OR																																							
Q.10	(a)	What is 2PL? Explain with an Example.	6																																				
	(b)	How do you detect a deadlock during concurrent transaction execution?	6																																				
	(c)	Explain the various database recovery techniques with suitable examples.	8																																				

Table showing the Bloom's Taxonomy Level, Course Outcome and Programme Outcome				
Question		Bloom's Taxonomy Level attached	Course Outcome	Programme Outcome
Q.1	(a)	L1,L2	CO-1	PO1,PO2
	(b)	L1,L2,L3	CO-1	PO1,PO2,PO4
	(c)	L1,L2	CO-1	PO1,PO2
Q.2	(a)	L1,L2	CO-1	PO1,PO2
	(b)	L1,L2,L3	CO-1	PO1,PO2,PO3
	(c)	L1,L2,L3	CO-1	PO1,PO2,PO4
Q.3	(a)	L1,L2	CO-2	PO1,PO2,PO3
	(b)	L1,L2,L3,L4,L6	CO-2	PO1,PO2,PO3,PO12
	(c)	L1,L2,L4,L5	CO-2	PO1,PO2,PO3,PO4
Q.4	(a)	L1,L2	CO-2	PO1,PO2,PO3
	(b)	L1,L2,L3,L4,L6	CO-2	PO1,PO2,PO3,PO12
	(c)	L1,L2,L4,L5	CO-2	PO1,PO2,PO4
Q.5	(a)	L1,L2	CO-3	PO1,PO2,PO3
	(b)	L1,L2,L3,L4,L6	CO-3	PO1,PO2,PO3,PO12
	(c)	L1,L2,L4,L5	CO-3	PO1,PO2,PO4
Q.6	(a)	L1,L2,L3,L4,L6	CO-3	PO1,PO2,PO3,PO12
	(b)	L1,L2,L4,L5	CO-3	PO1,PO2,PO3
	(c)	L1,L2	CO-3	PO1,PO2,PO3
Q.7	(a)	L1,L2,L4,L5	CO-4	PO1,PO2,PO3,PO4
	(b)	L1,L2,L3,L4,L6	CO-4	PO1,PO2,PO3,PO4
	(c)	L1,L2	CO-4	PO1,PO2,PO3,PO4
Q.8	(a)	L1,L2,L3,L4,L6	CO-4	PO1,PO2,PO3,PO12
	(b)	L1,L2,L3,L4,L6	CO-4	PO1,PO2,PO3,PO4, PO12
	(c)	L1,L2,L4	CO-4	PO1,PO2,PO3,PO4,PO 12
Q.9	(a)	L1,L2	CO-4	PO1,PO2,PO3
	(b)	L1,L2,L3,L4,L6	CO-4	PO1,PO2,PO3,PO4
	(c)	L1,L2,L4	CO-4	PO1,PO2,PO3
Q.10	(a)	L1,L2	CO-4	PO1,PO2,PO4

	(b)	L1,L2,L3	CO-4	PO1,PO2,PO3,PO4
	(c)	L1,L2,L3	CO-4	PO1,PO2,PO4
Lower order thinking skills				
Bloom's Taxonomy Levels		Remembering(knowledge): <i>L1</i>	Understanding (Comprehension): <i>L2</i>	Applying (Application): <i>L3</i>
	Higher order thinking skills			
		Analyzing (Analysis): <i>L4</i>	Valuating (Evaluation): <i>L5</i>	Creating (Synthesis): <i>L6</i>

Course Outcomes: The student will be able to:

- Identify, analyze and define database objects, enforce integrity constraints on a database using RDBMS.
- Use Structured Query Language (SQL) for database manipulation.
- Design and build simple database systems
- Develop application to interact with databases.

