HallTicketNo | | | | | | | | | | Question Paper Code: ACS553

INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)
Dundigal, Hyderabad - 500 043

MODEL QUESTION PAPER -2

B. Tech VII Semester End Examinations (Regular), November – 2019

Regulations: IARE-R16

FUNDAMENTAL OF DATABASE MANAGEMENT SYSTEMS

(EEE/MECH)

Time: 3hours **Max. Marks: 70**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the question must be answered in one place only

Unit – I

1 **a)** Consider the relations STUDENT(Table 1) and DEPT(Table 2): **[7M]**

Table 1: Student

Sname	Usn	Gender	D.no
Sangeetha	1	fe	10
Samartha	2	ma	20
Suraksha	3	fe	30
Suvarna	Ma	ma	10

Table 2: Dept

Dname	Dno
CSE	10
ECE	20
MECH	30

NOTE: Gender attribute in STUDENT relation is allowed to take only two possible values. They are {fe, ma}. Write update operations for the following

i.Write an INSERT operation on STUDENT relation which will violate domain constraint.

ii. Write a DELETE operation on DEPT which will violate referential integrity constraint.

iii. Write an UPDATE operation to modify department number of a student which will not violate any of the relational model constraint.

b) When is the concept of weak entity used in data modeling? Define the terms owner entity type, weak entity type, identifying relationship type and partial key. **[7M]**

2 **a)** Draw Three Schema Architecture for DBMS and explain in detail. **[7M]**

b) What are advantages of DBMS in real world applications? **[7M]**

Unit – II

3	a)	Discuss about unary relational operations in relational algebra with examples.	[7M]
	b)	How the statement "the sids of suppliers who supply some red or green part" can be represented in the form of relational algebra and tuple relational calculus from the above relations. Suppliers scheme: Suppliers(sid: INTEGER, sname: STRING, address: STRING)	[7M]
4	a)	Consider the following relational schema of CAR ACCIDENT database CAR(Car_Model, Car_Company, Car_num, Car_Price, Year_manufacture) DRIVER(Dri_Name, Dri_id, Dri_sex, Dri_salary, Dri_dob, Addr) PARTICIPATED(Carnum, Driid, Date_of_Accident, Place_of_Accident, Damage_amount) Write the following queries in relational calculus. i. Retrieve car model and car number of all the cars whose price is greater than 500000 ii. For each driver retrieve driver name along with places of accidents for that particular driver. iii. For each car which has met with at least one accident retrieve car model, Car Company along with total damage amount.	[7M]
	b)	How natural JOIN operation is different when compared to JOIN operation. Explain with an example?	[7M]

Unit – III

5	a)	Write a note on INSERT, DELETE, UPDATE commands in SQL	[7M]
	b)	R(ABCD) is relation with FD set {C→D, C→A, B→C}. Find (i) Candidate Key Normal form that can be existed Decompose in BCNF relations	[7M]
6	a)	By using supplier scheme which are given in write the SQL statements for the following queries 1. Find pairs of sids such that the supplier with the first sid charges more for some part than the supplier with the second sid. 2. Find the sids of suppliers who supply some red part and some green part.	[7M]
	b)	Explain the key constraints Primary key and Foreign key with examples	[7M]

Unit – IV

7	a)	Explain the need of concurrency control in transaction processing	[7M]
	b)	Consider the following schedule S1. S1=r3(y), r3(z), r1(x), w1(x), w3(y), w3(z), r2(z), r1(y), w1(y), r2(y), w2(y), r2(x), w2(x) Check whether S1 is serializable or not. If it is serializable, write its equivalent serial schedule.	[7M]
8	a)	Explain the time stamp ordering concurrency control technique with an example	[7M
	b)	With a neat diagram explain NO-UNDO/NO-REDO recovery mechanism in transaction	[7M]

Unit – V

9	a)	Compare the shadow-paging recovery scheme with the log-based recovery schemes in terms of overhead cost.	[7M]
	b)	What is Concurrency Control? Potential problems of Concurrency Write about Characteristics of Good Concurrency Protocol?	[7M]
10	a)	Explain the time stamp ordering concurrency control technique with an example.	[7M]
	b)	What is the Need for Recovery of data? Write about Recovery Facilities with an example?	[7M]

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COURSE OBJECTIVES

The course should enable the students to:

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I	Discuss the basic database concepts, applications, data models, schemas and instances.
II	esign Entity Relationship model for a database.
III	emonstrate the use of constraints and relational algebra operations.
IV	escribe the basics of SQL and construct queries using SQL.
V	Understand the importance of normalization in databases.

COURSE LEARNING OUTCOMES

Students, who complete the course, will have demonstrated the ability to do the following:

ACS553.01	Define the terminology, features, and characteristics of database system.
ACS553.02	Differentiate database systems from file systems.
ACS553.03	Describe Data Models, Schemas, Instances, Three Schema Architecture and DBMS Component Modules.
ACS553.04	Analyze an information storage problem and derive an information model expressed in the form of an entity relation diagram.
ACS553.05	Model the real world database systems using Entity Relationship Diagrams (ERD) from the requirements specification.
ACS553.06	Describe basics of the relational data model.
ACS553.07	Transform an information model into a relational database schema and implement schema using data definition language and/or utilities.
ACS553.08	Formulate solutions to a broad range of query problems using relational algebra.
ACS553.09	Apply relational calculus to solve broad range of query problems.
ACS553.10	Illustrate the Functional Dependencies , Inference Rules, Minimal Sets of FDs.
ACS553.11	Understand normalization theory and improve the design by normalization.
ACS553.12	Understand the properties of transaction (ACID).
ACS553.13	Demonstrate serializability by taking various schedules.
ACS553.14	Gain knowledge on transaction processing to maintain consistency and integrity of data in database systems.
ACS553.15	Describe concurrency control techniques to implement data integrity in database systems.
ACS553.16	Illustrate various backup and recovery techniques for database systems.
ACS553.17	Analyze transaction processing, concurrency control, Database recovery techniques.
ACS553.18	Illustrate various lock based protocols.
ACS553.19	Analyze various time stamp based protocols.
ACS553.20	Understand the concepts of update and shadow paging.

MAPPING OF SEMESTER END EXAM TO COURSE LEARNINIG OUTCOMES

SEE Question No.		Course Learning Outcomes		Outcomes	Blooms Taxonomy Level
1	a	ACS553.01	Define the terminology, features, and characteristics of database system	CO 1	Understand
	b	ACS553.02	Differentiate database systems from file systems.	CO 1	Remember
2	a	ACS553.03	Model the real world database systems using Entity Relationship Diagrams (ERD) from the requirements specification.	CO 1	Remember
	b	ACS553.05	Model the real world database systems using Entity Relationship Diagrams (ERD) from the requirements specification.	CO 1	Remember
3	a	ACS553.05	Formulate solutions to a broad range of query problems using relational algebra.	CO 2	Remember
	b	ACS553.07	Formulate solutions to a broad range of query problems using relational algebra.	CO 2	Understand
4	a	ACS553.08	Apply relational calculus to solve broad range of query problems	CO 2	Remember
	b	ACS553.08	Apply relational calculus to solve broad range of query problems	CO 2	Remember
5	a	ACS553.09	Transform an information model into a relational database schema and implement schema using data definition language and/or utilities.	CO 3	Remember
	b	ACS553.09	Transform an information model into a relational database schema and implement schema using data definition language and/or utilities	CO 3	Remember
6	a	ACS553.10	Illustrate the Functional Dependencies , Inference Rules, Minimal Sets of FDs.	CO 3	Remember
	b	ACS553.11	Transform an information model into a relational database schema and implement schema using data definition language and/or utilities.	CO 3	Remember
7	a	ACS553.13	Demonstrate serializability by taking various schedules.	CO 4	Remember
	b	ACS553.15	Describe concurrency control techniques to implement data integrity in database systems.	CO 4	Remember
8	a	ACS553.13	Demonstrate serializability by taking various schedules.	CO 4	Remember
	b	ACS553.14	Gain knowledge on transaction processing to maintain consistency and integrity of data in database systems.	CO 4	Remember
9	a	ACS553.17	Analyze transaction processing, concurrency control, Database recovery techniques.	CO 5	Remember
	b	ACS553.18	Illustrate various lock based protocols.	CO 5	Understand
10	a	ACS553.19	Illustrate various backup and recovery techniques for database systems.	CO 5	Understand
	b	ACS553.20	Understand the concepts of update and shadow paging.	CO 5	Understand

Signature of Course Coordinator **HOD, EEE**