USN											CS54

B. E. Degree (Autonomous) Fifth Semester End Examination (SEE), Dec 2018/Jan 2019

DATABASE MANAGEMENT SYSTEM

(Model Question Paper - 1)

Time: 3 Hours] **[Maximum Marks: 100**

Instructions to students:

1. **Answer FIVE FULL questions.**
2. **Answer ANY ONE from Question No.1 and 2**
3. **Answer ANY ONE from Question No.3 and 4**
4. **Answer ANY ONE from Question No.5 and 6**
5. **Answer ANY ONE from Question No.7 and 8**
6. **Answer ANY ONE from Question No.9 and 10**

1.	**a)**	Define the following terms. 1. DBMS 2. DBA 3. Metadata 4. Entity 5. Attribute	**10 Marks**
	b)	Draw the ER Diagram for student database considering at least minimum 5 entities	**10 Marks**
		OR	
2	**a)**	With a neat block diagram explain the DBMS architecture. Also discuss the 3 different levels of abstraction.	**10 Marks**
	b)	Explain with a neat sketch, the different phases of database design	**10 Marks**
3.	**a)**	With respect to the Relational data model, explain the concept of primary keys and Foreign keys. Illustrate your answer with examples.	**10 Marks**
	b)	Discuss the following relational algebra operations. Illustrate each of them with an example. 1. SELECT 2. PROJECT 3. DIFFERENCE 4. UNION	**10 Marks**
		OR	
4	**a)**	Discuss the entity integrity and referential integrity constraints. Why each one is considered important.	**06 Marks**
	b)	Explain domain constraints, key constraints and constraints on NULL values.	**07 Marks**
	c)	With the help of examples, explain the different set operations in relational algebra.	**07 Marks**
5	**a)**	Consider the following relation schema Project(P_No, P_Name, P_Incharge) Employee(E_No, E_Name) Assigned_to(P_No, E_No) Write the SQL Quires for the following: (i) List details of employees who are working on all the projects. (ii) List E_No of employees who are not working on project number 2K. (iii) List the names of employees who are working in the same project as employee named 'Tom'. (iv) List the names of employees who are not working in any project.	**10 Marks**

	b)	What do you mean by JOIN in SQL? Explain various JOIN operations in SQL with an example.	**10 Marks**
		OR	
6	**a)**	Explain more complex SQL queries with examples.	**10 Marks**
	b)	Briefly explain Views in SQL along with the syntax. Discuss the problems that may arise when one attempts to update a view. How are views practically implemented?	**10 Marks**
7.	**a)**	What is the need for normalization? Explain 1NF, 2NF, 3NF with examples.	**10 Marks**
	b)	Consider the universal relation R={A,B,C,D,E,F,G,H,I,J} and the set of functional dependencies F={{A,B}→{C}, {A}→{D,E}, {B}→{F}, {F}→{G,H}, {D}→{I.J}}. What is the key for R? Decompose R into 2 NF and then 3 NF relations.	**10 Marks**
		OR	
8	**a)**	Consider the following relations: CAR_SALE(Car_no, Date_sold, Salesman_no, Commission_%, Discount) (Assume a car can be sold by multiple sales man and hence primary key is {car_no, Salesman_no}) Additional dependencies are:date_sold->Discount_amt and Salesman_no->Commission_%. i. Is this relation in 1NF, 2NF, 3NF? Why or why not? ii How would you normalize this completely?	**12 Marks**
	b)	Define Boyce-Codd normal form. How does it differ from 3 NF? Why is it considered a stronger form of 3 NF?	**08 Marks**
9.	**a)**	Explain a mechanism of concurrency control that uses time stamping with the help of an example	**10 Marks**
	b)	Discuss the problems of deadlock and starvation and different approaches to deal with these problems.	**10 Marks**
		OR	
10.	**a)**	Explain Multiple-granularity locking with example and also explain under what circumstances is it used.	**10 Marks**
	b)	Prove that Strict two Phase locking protocol guarantees Strict Schedule with example	**10 Marks**

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DATABASE MANAGEMENT SYSTEM

(Model Question Paper - 2)

Time: 3 Hours] **[Maximum Marks: 100**

Instructions to students:

1. **Answer FIVE FULL questions.**
2. **Answer ANY ONE from Question No.1 and 2**
3. **Answer ANY ONE from Question No.3 and 4**
4. **Answer ANY ONE from Question No.5 and 6**
5. **Answer ANY ONE from Question No.7 and 8**
6. **Answer ANY ONE from Question No.9 and 10**

1.	**a)**	Bring out the important advantages and disadvantages of DBMS over file system.	**06 Marks**
	b)	Define entity, entity set, attribute with respect to ER model. List different types of attributes along with their symbols.	**08 Marks**
	c)	Explain three schema architecture and languages used at each level.	**06 Marks**
		OR	
2	**a)**	With a neat block diagram explain the DBMS architecture. Also discuss the 3 different levels of abstraction.	**10 Marks**
	b)	Draw the ER Diagram for Bank database considering at least minimum 5 entities	**10 Marks**
3.	**a)**	Consider the following schema for a company database. Employee (Name, SSN, Address, Sex, Salary, Dno) Department (Dname, Dnumber, MGR SSN, MGRSTART DATE) Dept_Location (Dnumber, Dlocations) Project (Pname, Pnumber, Plocation, Dnum) Works_on (ESSN, Pno, Hours) Dependent (ESSN, Dependent_name, Sex, Ddate, Relationship) Write the queries in relational algebra to 1. Retrieve the name and address of all employees who work for the research department 2. Find the name of employees who work on all projects controlled by department number 5. 3. List all projects on which employee Smith is working. 4. Retrieve the names of employees who have no dependents.	**10 Marks**
	b)	Define the terms with an example for each 1. Domain 2. Relation schema 3. Relation state 4. Relation database schema.	**10 Marks**
		OR	
4	**a)**	With respect to the Relational data model, explain the concept of primary keys and Foreign keys. Illustrate your answer with examples.	**10 Marks**
	b)	Discuss the following relational algebra operations. Illustrate each of them with an example. 1. SELECT 2. PROJECT 3. DIFFERENCE 4. UNION	**10 Marks**

5	**a)**	Explain Insert, Delete & Update Operation with example.	**08 Marks**
	b)	What do you mean by JOIN? Explain various JOIN operations in SQL with an example.	**08 Marks**
	c)	Explain Set theoretic operations used in SQL.	**04 Marks**
		OR	
6	**a)**	List the data types that are allowed for SQL attributes.examples.	**04 Marks**
	b)	Consider the following relation schema Project(P_No, P_Name, P_Incharge) Employee(E_No, E_Name) Assigned_to(P_No, E_No) Write the SQL Quires for the following: (i) List details of employees who are working on all the projects. (ii) List E_No of employees who are not working on project number 2K. (iii) List the names of employees who are working in the same project as employee named 'Tom'. (iv) List the names of employees who are not working in any project.	**08 Marks**
	c)	How are Triggers and Assertions are defined in SQL explain with example.	**08 Marks**
7.	**a)**	State the informal guidelines for relational schema design. Illustrate how violation of these guidelines may be harmful.	**10 Marks**
	b)	Explain Multi-valued Dependencies, Fourth Normal Form, Join Dependencies and Fifth Normal Form with examples.	**10 Marks**
		OR	
8	**a)**	What is the need for normalization? Explain 1NF, 2NF, 3NF with examples.	**10 Marks**
	b)	Consider the universal relation R={A,B,C,D,E,F,G,H,I,J} and the set of functional dependencies F={{A,B}→{C}, {A}→{D,E}, {B}→{F}, {F}→{G,H}, {D}→{I.J}}. What is the key for R? Decompose R into 2 NF and then 3 NF relations.	**10 Marks**
9.	**a)**	Discuss the ACID properties.	**04 Marks**
	b)	Which of the following schedules is (conflict) serializable? For each serializable schedule, determine the equivalent serial schedules. 1. r1(x); r3(x); w1(x); r2(x); w3(x); 2. r1(x); r3(x); w3(x); w1(x); r2(x); 3. r3(x); r2(x); w3(x); r1(x); w1(x); 4. r3(x); r2(x); r1(x); w3(x); w1(x);	**12 Marks**
	c)	What is a schedule (history)? Define the concept of strict schedules.	**04 Marks**
		OR	
10.	**a)**	Explain the two phase locking protocol with examples and along with its advantages.	**08 Marks**
	b)	Explain time stamp ordering algorithm with example.	**08 Marks**
	c)	Explain Serializability with example. How can serializability be ensured? Do you need to restrict concurrent execution of transaction to ensure serializability? Justify your answer.	**04 Marks**

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DATABASE MANAGEMENT SYSTEM

(Model Question Paper - 3)

Time: 3 Hours] [Maximum M

Instructions to students:

1. **Answer FIVE FULL questions.**
2. **Question No. 1, 2 and 5 are COMPULSORY**
3. **Answer ANY ONE from Question No.3 and 4**
4. **Answer ANY ONE from Question No. 6 and 7**

1.	a)	Bring out the important advantages and disadvantages of DBMS over file system.	06 Marks
	b)	Define entity, entity set, attribute with respect to ER model. List different types of attributes along with their symbols.	08 Marks
	c)	Explain three schema architecture and languages used at each level.	06 Marks
2.	a)	Consider the following schema for a company database. Employee (Name, SSN, Address, Sex, Salary, Dno) Department (Dname, Dnumber, MGR SSN, MGRSTART DATE) Dept_Location (Dnumber, Dlocations) Project (Pname, Pnumber, Plocation, Dnum) Works_on (ESSN, Pno, Hours) Dependent (ESSN, Dependent_name, Sex, Ddate, Relationship) Write the queries in relational algebra to 1. Retrieve the name and address of all employees who work for the research department 2. Find the name of employees who work on all projects controlled by department number 5. 3. List all projects on which employee Smith is working. 4. Retrieve the names of employees who have no dependents.	10 Marks
	b)	Define the terms with an example for each 1. Domain 2. Relation schema 3. Relation state 4. Relation database schema.	10 Marks
3	a)	Explain Insert, Delete & Update Operation with example.	08 Marks
	b)	What do you mean by JOIN? Explain various JOIN operations in SQL with an example.	08 Marks
	c)	Explain Set theoretic operations used in SQL.	04 Marks
		OR	
4	a)	List the data types that are allowed for SQL attributes.examples.	04 Marks

	b)	Write the SQL statement for Question no: 2 (A).	**08 Marks**
	c)	How are Triggers and Assertions are defined in SQL explain with example.	**08 Marks**
5.	**a)**	State the informal guidelines for relational schema design. Illustrate how violation of these guidelines may be harmful.	**10 Marks**
	b)	Explain Multi-valued Dependencies, Fourth Normal Form, Join Dependencies and Fifth Normal Form with examples.	**10 Marks**
6.	**a)**	Discuss the ACID properties.	**04 Marks**
	b)	Which of the following schedules is (conflict) serializable? For each serializable schedule, determine the equivalent serial schedules. 1. r1(x); r3(x); w1(x); r2(x); w3(x); 2. r1(x); r3(x); w3(x); w1(x); r2(x); 3. r3(x); r2(x); w3(x); r1(x); w1(x); 4. r3(x); r2(x); r1(x); w3(x); w1(x);	**12 Marks**
	c)	What is a schedule (history)? Define the concept of strict schedules.	**04 Marks**
		OR	
7.	**a)**	Explain the two phase locking protocol with examples and along with its advantages.	**08 Marks**
	b)	Explain time stamp ordering algorithm with example.	**08 Marks**
	c)	Explain Serializability with example. How can serializability be ensured? Do you need to restrict concurrent execution of transaction to ensure serializability? Justify your answer.	**04 Marks**

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