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

USN | | | | | | | | | | |

Fifth Semester B.E. Degree Examination

Data Base Management System

TIME: 03 Hours **Max. Marks: 100**

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

		Module – 1	
Q.1	**(a)**	Compare DBMS and early file systems bringing out the major advantages of the database approach.	6M
	(b)	With a neat block diagram, explain the architecture of a typical DBMS.	10M
	(c)	Explain different types of user friendly interfaces and types of user who typically use each.	4M
		OR	
Q2	**(a)**	Define the following with an example: (i) Weak entity type (ii) participation constraint (iii)cardinality ratio (iv) recursive relationship (v) specialization	10M
	(b)	Develop an ER diagram for keeping track of information about a company database taking into account atleast five entities.	10M
		Module – 2	
Q.3	**(a)**	Define the following terms i) Key ii) Super key iii) Candidate key iv) Primary key v) Foreign key	5M
	(b)	Consider the following COMPANY database EMP(Name,SSN,Salary,SuperSSN,Gender,Dno) DEPT(DNum,Dname,MgrSSN,Dno) DEPT_LOC(Dnum,Dlocation) DEPENDENT(ESSN,Dep_name,Sex) WORKS_ON(ESSN,Pno,Hours) PROJECT(Pname,Pnumber,Plocation,Dnum) Write the **relational algebra** queries for the following (i)Retrieve the name, address, salary of employees who work for the Research department. (ii) find the names of employees who work on all projects controlled by department number4. iii) Retrieve the SSN of all employees who either in department no :4 or directly supervise an employee who work in department number :4 (iv) Retrieve the names of employees who have no dependents (v) Retrieve each department number, the number of employees in the department and their average salary.	10M
	(c)	Summarize the steps involved in converting the ER constructs to corresponding relational tables.	5M
		OR	
	(a)	Explain with example basic constraints that can be specified when a database table is created.	4M

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Q.4	**(b)**	Write SQL syntax for the following with example: (i) SELECT (ii) ALTER (iii) UPDATE	6
	(c)	Consider the following relation schema Works(Pname,Cname,salary) Lives(Pname,Street,City) located_in (Cname, city) Manager(Pname,Mgrname) Write the SQL queries for the following i) Find the names of all persons who live in the city Bangalore. ii) Retrieve the names of all person of "Infosys" whose salary is between Rs .50000 iii)Find the names of all persons who lives and work in the same city iv)List the names of the people who work for "Tech M" along with the cities they live in. v)Find the average salary of "Infosys" persons	10M
Module – 3			
Q.5	**(a)**	Explain the following constructs used in SQL with example: (i)Nested queries ii)Aggregate functions iii) Triggers iv)Views and their updability v) schema change statements	5M
	(b)	What is Dynamic SQL? How it is different from Embedded SQL	10M
	(c)	Consider the following COMPANY database(10 marks) EMP(Name,SSN,Salary,SuperSSN,Dno) DEPT(DNum,Dname,MgrSSN,Dno) DEPT_LOC(Dnum,Dlocation) DEPENDENT(ESSN,Dep_name,Sex) WORKS_ON(ESSN,Pno,Hours) PROJECT(Pname,Pnumber,Plocation,Dnum) Write the **SQL** queries for the following i) Retrieve the name of the employee who works with same department as ravi ii)Retrieve the number of dependents for an employee "Ravi" iii)Retrieve the name of the managers working in location "DELHI"who has no female dependents iv)List female employees from Dno=20 earning more than 50000 v)List "CSE" department details	5M
OR			
Q.6	**(a)**	What is SQLJ? How it is different from JDBC.	4M
	(b)	Draw and explain 3-tier Architecture and technology relevant to each tier. Write the advantages of 3- tier architecture.	6M
	(c)	Write a short note on a)html forms b)Java scripts c)CGI d)Application servers e)Servlets	10M
Module – 4			
Q.7	**(a)**	Explain insertion, deletion and modification anomalies. Why are they considered bad? Illustrate with example.	4M
	(b)	Explain 1NF,2NF,3NF with example.	6M
	(c)	Consider the relation schema R(A,B,C,D,E,F) and the functional dependencies A->B,C->DF,AC->E, D->F.What is the primary key of this relation R?What is its highest normal form?Preserving the dependency,decompose R into third normal form.	10M
OR			

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Q.8	**(a)**	Define non-additive join property of a decomposition and write an algorithm for testing of non additive join property.	5M
	(b)	Write the algorithm to find the minimal cover for a sets of FD's Consider R={A,B,C,D,E,F} .FD's {A->C,AC->D,E->AD,E->H} Find the irreducible cover for this set of FD's(minimal cover)	10M
	(c)	Given below are two sets of FD's for a relation R(A,B,C,D,E).Are they equivalent? F={A->C,AC->D,E->AD,E->H} and G={A->CD,E->AH}	5M
Module – 5			
Q.9	**(a)**	Briefly discuss on the two phase locking protocol used in concurrency control. How does it gurantees serializability.	10M
	(b)	Check whether given schedule is serializable or not using precedence graph. Explain with algorithm. S1:R1(X) R2(Z) R1(Z) R3(X) R3(Y) W1(X) W3(Y) R2(Y) W2(Z) W2(Y)	6M
	(c)	Explain Basic time stamping algorithm.	4M
OR			
Q.10	**(a)**	Explain multi version concurrency control protocols.	10M
	(b)	Write short notes on the following I. transaction rollback and cascading rollback. II. transaction support in SQL III. shadow paging IV. NO-UNDO/REDO Recovery Based on Deferred Update V. Recovery Techniques Based on Immediate Update	10M

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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)	L2	CO1	PO1
	(b)	L2	CO1	PO1
	(c)	L2	CO1	PO1
Q.2	(a)	L1	CO1	PO1
	(b)	L3	CO1	PO1
Q.3	(a)	L1	CO1	PO1
	(b)	L3	CO1	PO1
	(c)	L2	CO1	PO1
Q.4	(a)	L2	CO2	PO2,PO3
	(b)	L2	CO2	PO2,PO3
	(c)	L3	CO2	PO2,PO3
Q.5	(a)	L2	CO2	PO2,PO3
	(b)	L2	CO2	PO2,PO3
	(c)	L3	CO2	PO2,PO3
Q.6	(a)	L2	CO4	PO1,PO3
	(b)	L2	CO4	PO1,PO3
	(c)	L2	CO4	PO1,PO3
Q.7	(a)	L2	CO3	PO2,PO3
	(b)	L2	CO3	PO2,PO3
	(c)	L3	CO3	PO2,PO3
Q.8	(a)	L2	CO3	PO2,PO3
	(b)	L3	CO3	PO2,PO3
	(c)	L3	CO3	PO2,PO3
Q.9	(a)	L2	CO3	PO1
	(b)	L3	CO3	PO1
	(c)	L2	CO3	PO1
Q.10	(a)	L2	CO3	PO1
	(b)	L2	CO3	PO1

Bloom's Taxonomy Levels	**Lower order thinking skills**		
	Remembering(knowledge):L_1	Understanding Comprehension): L_2	Applying (Application): L_3
	Higher order thinking skills		
	Analyzing (Analysis): L_4	Valuating (Evaluation): L_5	Creating (Synthesis): L_6

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Fifth Semester B.E. Degree Examination

Database Management System

TIME: 03 Hours **Max. Marks: 100**

Note: 01. Answer any **FIVE** full questions, choosing at least **ONE** question from each **MODULE**.
02.
03.

		Module – 1	Marks
Q.1	**(a)**	List and briefly explain the characteristics of Database Approach	8
	(b)	Briefly explain the Following i.Database ii. DBMS	2
	(c)	List and briefly explain the advantages of using DBMS Approach	10
		OR	
Q.2	**(a)**	Briefly explain the following i. Database Schema ii. Weak Entity Type	2
	(b)	With a neat diagram, explain the Three Schema Architecture	8
	(c)	Draw an ER Diagram for University Database by considering at least 5 entities	10
		Module – 2	**Marks**
Q.3	**(a)**	List & briefly explain the characteristics of Relations	8
	(b)	Briefly explain the following i. Domain Constraints ii. Referential Integrity Constraints	2
	(c)	By refereeing the following Database schema. Employee(Fname, Minit, Lname, SSN, Bdate, Address, Sex, Salary, Sup_SSN,Dno) Department(Dname, Dnumber, Mgr_SSN, Mgr_Start_date) Dept_Locations(Dnumber, Dlocation) Project(Pname, Pnumber, Plocation, Dnum) Works_On(Essn, Pno, Hours) Dependent (Essn, Dependent_Name, Sex, Bdate, Relationship) **Write the relational algebra expressions for the following queries** (i) Retrieve all the employee names who are working for department number 5. (ii) Retrieve all the projects which are controlled by department number 4. (iii) Retrieve the names of employees who have no dependents. (iv) Retrieve all the Employee Name who is working on all the projects in which John Smith works on. (v) Retrieve all the project numbers along with number of employee working on each project	10
		OR	
Q.4	**(a)**	With an example explain the steps of ER to Relational Mapping Algorithm	10
	(b)	List and briefly explain the various attribute Data Types and Domains in SQL	7

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	(c)	With an explain, UPDATE Statement in SQL	3
Module – 3			**Marks**
Q.5	**(a)**	By refereeing the following Database schema. Employee(Fname, Minit, Lname, SSN, Bdate, Address, Sex, Salary, Sup_SSN,Dno) Department(Dname, Dnumber, Mgr_SSN, Mgr_Start_date) Dept_Locations(Dnumber, Dlocation) Project(Pname, Pnumber, Plocation, Dnum) Works_On(Essn, Pno, Hours) Dependent (Essn, Dependent_Name, Sex, Bdate, Relationship) **Write the SQL Queries for the following** (i). Retrieve the name and address of all employees who work for the 'Research' department. (ii). Make a list of all project numbers for projects that involve an employee whose last name is 'Smith', either as a worker or as a manager of the department that controls the project. (iii). List the names of managers who have at least one dependent. (iv). Find the sum of the salaries of all employees, the maximum salary, the minimum salary, and the average salary. (v). For each project, retrieve the project number, the project name, and the number of employees who work on that project.	10
	(b)	With an example, explain Specifying Constraints as Assertions in SQL	5
	(c)	With an example, explain the concept of View in SQL	5
OR			
Q.6	**(a)**	With an example, explain Cursors in Embedded SQL.	5
	(b)	List & briefly explain different types of JDBC Drivers	5
	(c)	With a neat diagram, Explain Three Tier Architecture Database Applications and briefly explain the advantages of Three tier Architecture.	10
Module – 4			**Marks**
Q.7	**(a)**	With an suitable explain Informal Design Guidelines for Relation Schemas	10
	(b)	With an suitable explain, First Normal Form, Second Normal Form, & Third Normal Form	10
OR			
Q.8	**(a)**	With an suitable example, explain Properties of Relational Decompositions	10
	(b)	Consider the relation REFRIG(Model#, Year, Price, Manuf_plant, Color), which is abbreviated as REFRIG(M, Y, P, MP, C), and the following set *F* of functional dependencies: $F = \{M \rightarrow MP, \{M, Y\} \rightarrow P, MP \rightarrow C\}$ (i) Evaluate each of the following as a candidate key for REFRIG, giving reasons why it can or cannot be a key: {M}, {M, Y}, {M, C}. (ii) Based on the above key determination, state whether the relation REFRIG is in 3NF and in BCNF, giving proper reasons. (iii)Consider the decomposition of REFRIG into $D = \{R1(M, Y, P), R2(M, MP,C)\}$. Is this decomposition lossless?	10
Module – 5			**Marks**
Q.9	**(a)**	List and explain ACID Properties	5
	(b)	Briefly explain two phase locking protocol	5
	(c)	Consider the three transactions *T*1, *T*2, and *T*3, and the schedules *S*1 and *S*2 given below. Draw the serializability (precedence) graphs for *S*1 and *S*2, and state whether	10

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		each schedule is serializable or not. If a schedule is serializable, write down the equivalent serial schedule(s). *T*1: *r*1 (*X*); *r*1 (*Z*); *w*1 (*X*); *T*2: *r*2 (*Z*); *r*2 (*Y*); *w*2 (*Z*); *w*2 (*Y*); *T*3: *r*3 (*X*); *r*3 (*Y*); *w*3 (*Y*); *S*1: *r*1 (*X*); *r*2 (*Z*); *r*1 (*Z*); *r*3 (*X*); *r*3 (*Y*); *w*1 (*X*); *w*3 (*Y*); *r*2 (*Y*); *w*2 (*Z*); *w*2 (*Y*); *S*2: *r*1 (*X*); *r*2 (*Z*); *r*3 (*X*); *r*1 (*Z*); *r*2 (*Y*); *r*3 (*Y*); *w*1 (*X*); *w*2 (*Z*); *w*3 (*Y*); *w*2 (*Y*);	
OR			
Q.10	**(a)**	With an example, explain basic Timestamp Ordering algorithm for Concurrency Control	6
	(b)	Briefly explain Transaction Support in SQL	4
	(b)	With an example, explain ARIES Recovery Algorithm	10

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Q.2	(a)	L1	CO1	PO1
	(b)	L2	CO1	PO1
	(c)	L6	CO1	PO3
Q.3	(a)	L2	CO2	PO1
	(b)	L1	CO2	PO1
	(c)	L3	CO2	PO3
Q.4	(a)	L2	CO2	PO4
	(b)	L1	CO2	PO1
	(c)	L3	CO2	PO3
Q.5	(a)	L3	CO3	PO3
	(b)	L2	CO3	PO4
	(c)	L2	CO3	PO3
Q.6	(a)	L2	CO3	PO1
	(b)	L1	CO3	PO1
	(c)	L1	CO3	PO1
Q.7	(a)	L1	CO4	PO1
	(b)	L2	CO4	PO2
Q.8	(a)	L2	CO4	PO2
	(b)	L5	CO4	PO4
Q.9	(a)	L1	CO5	PO1
	(b)	L2	CO5	PO1
	(c)	L4	CO5	PO2
Q.10	(a)	L2	CO5	PO1
	(b)	L1	CO5	PO1
	(c)	L3	CO5	PO4

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	Higher order thinking skills		
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