Sample Question Format

KIIT Deemed to be University
Online Mid Semester Examination(Autumn Semester-2021)

Subject Name & Code: DBMS(CS-2004)
Applicable to Courses: B.Tech CSCE

Full Marks=20 **Time:1 Hour**

SECTION-A(Answer All Questions. All questions carry 2 Marks)

Time:20 Minutes **(5×2=10 Marks)**

Question No	Question Type(MCQ/SAT)	Question	Answer Key(if MCQ)	CO Mapping
Q.No:1(a)	MCQ	Which of the following is not a part of conceptual level in three schema architecture of database management system? A. Storage dependent details B. Entities,attributes and relations C. Constraints D. Semantic information	A	CO1
	MCQ	Which of the following statements are correct about data models? I. In a Hierarchical model records are arranged as tree structure. II. Network model is record based logical model and represents complex data relationships better than hierarchical model. III. Hierarchical data model can able to represent M:N relationships just like network model. IV. Relational data model represents the database as collection of relations, which resembles a table of values. A. II and III B. I,II,IV	B	CO1

		C. Only IV D. All of the above		
	MCQ	What options are incorrect about Database Administrator? I. DBA implements specific application program to access the stored data. II. DBA is responsible for authorizing access to the database and monitors its use. III. DBA forms their requests in a database query language and submit each such query to a query processor. IV. DBA carries out changes to the schema A. II and III B. I and III C. Only I D. Only III	B	CO1
	MCQ	Which constraint is specified between two relations and is used to maintain the consistency among tuples of two relations? A. Domain Constraint B. Entity Integrity C. Referential Integrity D. Operational integrity	C	CO1
Q.No:1(b)	MCQ	Consider two entity sets named as CUSTOMER and PRODUCT and the relationship set ORDER having cardinality **M:N** The customer attributes are (cus_id,cus_name, cust_contact number as multi-valued attribute) and Product(prod_id,prod_name) What is the minimum number of tables required represent this situation in the relation model? A. 2 B. 3 C. 4 D. 5	C	CO2
	MCQ	In a banking database management system,any number of credit cards can belong to a customer and	D	Co2

		there might be some customer who do not have any credit card,but every credit card in a system has to be associated with a customer while a single credit card can't belong to multiple customers. Which one of the following correctly represents the cardinality and participation for the relationship between credit card and customer? A. 1:1, total, partial B. 1:1, partial, partial C. 1:M, partial, total D. M:1, total, partial		
	MCQ	Each Employee job can be either a secretary or a technician or an engineer. Which of the following specialization is suitable based on job? A. Disjoint,partial specialization B. Overlapping,partial specialization C. Overlapping,total specialization D. Disjoint,total specialization	D	CO2
	MCQ	Which of the following statements is false about weak entity set? A. Weak entities can be deleted automatically when their strong entity is deleted B. Weak entity set avoids the data duplication and consequent possible inconsistencies caused by duplicating the key of the strong entity C. A weak entity set has no primary keys unless attributes of the strong entity set on which it depends are included D. Tuples in a weak entity set are not partitioned according to their relationship with tuples with a strong entity set.	D	CO2
Q.No:1(c)	MCQ	Given the relations	C	CO3

		Staff(name, salary, dept-no), department(dept-no, dept-name,address) Which of the following queries cannot be expressed using the basic relational algebra operations (σ, π, x, -, ∪ , ρ) A. Department address of every staff B. Staff whose name is the same as their department name C. The sum of all staff's salaries D. All staffs of a given department		
	MCQ	Passenger(pid, pname, dob, mob, city) Bus(regdno, bname, from_city, to_city) Travel(pid, regdno, date) Which of these is correct to find pairs of passenger name who are staying in same city? A. SELECT pname FROM Passenger WHERE city=city; B. SELECT pname FROM Passenger p1, Passenger p2; C. SELECT pname FROM Passenger p1, Passenger p2 WHERE p1.city=p2.city; D. SELECT p1.pname, p2.pname FROM Passenger p1, Passenger p2 WHERE p1.city=p2.city;	D	CO3
	MCQ	Passenger (pid, pname, dob, mob, city) Bus (regdno, bname, from_city, to_city) Travel (pid, regdno, date) Which of these is correct to find passenger names whose city is same as the from_city of travelling? A. SELECT pname FROM Passenger, Bus, Travel; B. SELECT pname FROM Passenger, Bus, Travel WHERE Passenger.pid=Travel.pid AND	C	CO3

		Travel.regdno=Bus.regdno; C. SELECT pname FROM Passenger, Bus, Travel WHERE Passenger.pid=Travel.pid AND Travel.regdno=Bus.regdno AND Passenger.city=Bus.from_city; D. SELECT pname FROM Passenger, Bus, Travel WHERE Passenger.city=Bus.from_city;		
	MCQ	What will be the output if the following is executed? Select * from Employee where ename like '_A%'; A. Display the details of only the employees whose name has 'A' in the second position. B. Display the details of only the employees whose name ends with 'A'. C. Display the details of the employees whose name consists of 'A' at any position. D. All of the above.	A	CO3
Q.No:1(d)	MCQ	What is the SQL command to add Stud_id and Stud_name as composite key for student table using ALTER command A. ALTER table Student CONSTRAINT CompKey_studidstudname PRIMAR KEY(Stud_id,Stud_name); B. ALTER table Student ADD CompKey_studidstudname PRIMAR KEY (Stud_id,Stud_name); C. ALTER table Student ADD CONSTRAINT CompKey_studidstudname PRIMAR KEY (Stud_id,Stud_name); D. ALTER table Student ADD CONSTRAINT CompKey_studidstudname COMPOSITE KEY(Stud_id,Stud_name);	C	CO3
	MCQ	Consider two relations T(P, Q) with the tuples (1, 6), (3, 7)	B	CO3

		and S(P, R) = (1, 7), (4, 9). Assume that R(P,Q,R) is the full natural outer join of T and S. Consider the following tuples of the form (P,Q,R) a = (1, 6, null), b = (1, null, 7), c = (3, null, 9), d = (4, 7, null), e = (1, 6, 7), f = (3, 7, null), g = (4, null, 9). Which one of the following statements is correct? A. R contains a, b, c, d, e, f, g B. R contains e, f, g but not a, b C. R contains e but not f, g D. R contains a, b, e, f, g but not c, d		
	MCQ	Consider the following relations: PERSON(<u>pid</u>, pname) ITEM(<u>ino</u>,I_category) ORDER(<u>pid,ino</u>,order_amount) Which of the following queries are equivalent to this query in English? "Find the distinct names of all persons whose order_amount is more than 5000 for the Item numbered 165" I. SELECT DISTINCT P.pname FROM person as P, order as O WHERE O.pid=P.pid AND O.ino=165 AND O.order_amount >5000; II. $\prod$pname(σ_{ino}=165$\wedge$order_amount>5000(ITEM $\bowtie$ ORDER) III. {T|$\exists$P$\in$person,$\exists$O$\in$order (P.pid=O.pid $\wedge$ O.ino=165 $\wedge$O.order_amount>5000$\wedge$T.pname=P.pname)} A. I & II	C	CO3

		B. II & III C. I & III D. All of the above		
	MCQ	Which of the following statements are TRUE about an SQL query? P : An SQL query can contain a HAVING clause only if it has a GROUP BY clause Q : An SQL query can contain a HAVING clause even if it does not have a GROUP BY clause R : All attributes used in the GROUP BY clause must appear in the SELECT clause S : Not all attributes used in the GROUP BY clause need to appear in the SELECT clause **(A)** P and R **(B)** P and S **(C)** Q and R **(D)** Q and S	D	CO3
Q.No:1(e)	MCQ	Given the relation R (W, X, Y, Z) and the set F={WX→Y, X→Z, Z→X}. Find the candidate keys of the relation. A. WX and YZ B. XY and WZ C. WY and XZ D. WX and WZ	D	CO4
	MCQ	Let R (A, B, C, D, E) be a relations schema with the following set of functional dependencies, F= {A → B, B → D, A → C, CD → E, E → A} Which of the following functional dependencies is NOT implied by the above set? a. AB → EC b. CD → BC c. AC → BD d. BD → CD	Option d	CO4
	MCQ	For a given relation schema R={A, B, C, D, K} A→BC, CD→K, B→D, K→A Which of the following is not a candidate key? a. A b. B c. K d. BC	Option b:B	CO4
	MCQ	From the following instance of a relational schema R (A, B, C), which of the following	C	CO4

		functional dependencies hold true on R? **A** **B** **C** **2** **2** **2** **2** **2** **0** **8** **5** **8** **8** **5** **8** **4** **5** **8** a) A→ B and A→ C b) A→ C and B → C c) C → B and A → B d) C → A and C → B		

SECTION-B(Answer Any One Question. Each Question carries 10 Marks)

Time: 30 Minutes **(1×10=10 Marks)**

Question No	Question	CO Mapping
Q.No:2	Draw the entity- relationship diagram for shopping Mall database. There are many departments exist. Each department has one unique did, dname,location and strength as attributes. Employees (identified by unique empid along with ename, doj, contactno(as multi-valued attribute),year_of_experience (derived attribute) are working in different departments; one employee can work in maximum one department. Different customers are visiting different departments. Employees are managing the customers. Each customer has one unique cid along with cname and address (composed to state, street_address,city and zip). All customers are categorized as either Preferred Customers (membership as extra attribute) or General Customers (shopping habits as extra attribute). (a) Design an ER diagram to capture the above requirements. Clearly specify the cardinalities and primary keys. [5 marks] (b) Map the ERD in above question to create the relational model. (Indicate primary keys as well as referential integrity constraint). [3 marks] (c) Distinguish between disjoint and overlapping constraints with suitable example.[2 marks]	CO2
Q.No:3	**CUSTOMER (cust_num, cust_name, street, city) DEPOSIT (acc_num, cust_num, balance, branch_name) LOAN (loan_num, cust_num, loan_amt, branch_name)**	CO3

	a) Write SQL statements to create the given tables(customer,deposit and loan) along with necessary key constraints (primary as well as foreign keys). Also ensure that name of the customer and depositing branch name cannot be null.[4 marks] b) Solve the following queries using both relational algebra and SQL.[2×3] I. Find the loan details of the customers who has taken a loan more than Rs. 20,000 from 'KIIT_PATIA' branch. II. Display the account number and customer number who are having balance not more than Rs. 60,000. III. Display the customer number who is having an account balance less than 25,000 but not having a loan.	
Q.No:4	Consider a university database that will store information about all their staff members,students,courses,subjects,department and other details.Staff members(having unique SSn,job_type,birth_date) can be classified either as faculty or administrative staff or worker through an attribute defined specialization on job_type.Faculty members (identified by faculty-id, with faculty-name,faculty_phone number(multivalued attribute), doj, and specialization as attributes) belong to several departments((identified by dept-id, with dept-name as attributes).Each department is managed by one Director, who is also a faculty member.For students, the database stores the details like name, roll, dob, age, hobby, and address. The address consists of door_no, street_name, city, state, and pin. A student can register for many courses where each course has a unique course_id, and course_name. Similarly, a course can be taken by many students.A faculty can teach only one subject, where the subject has a unique subject_id, subject_name, and duration. However, a subject can be taught by many faculties. . Each Course consists of many subjects; however one subject can belongs to multiple courses.All students are managed by the faculties. (a) Draw EER diagram for the above scenario .[6 marks] (b) Convert the ER diagram into relational schema.[4 marks]	CO2
Q.No:5	Consider the information requirements of book clubs, located in a town, as follows: Each book club (identified by club-id with club-name and location as its attributes) has members (identified by member-id with member-name and address as its attributes). The book club sells books (identified by isbn-number with title as attributes) to its	CO3

	members. The members place orders (identified by order-id, with date as attributes) for books, which the book club fulfills. Each order contains one or more than one books. The books are written by author(s) (identified by author-id, with name as its attributes). A publisher (identified by publisher-name with address as attributes) can publish many books but a book cannot be published by more than one publisher. An authors can write more than one book and a book can have more than one author. A member can place more than one order. He/she also can choose not to place an order. The book club sells many books. Answer the following questions: a) Construct the ER diagram. [6 marks] b) Map the ER diagram to relations and identify the primary and foreign keys. [4 marks]	
Q.No:6	(a) Given relation R(K, L, M, N, O, P) with a set of functional dependencies {K→LM, K→L. K→M, L→M, N→OP, O→P, M→N, K→N, KM→N, KN→P}. Find the canonical cover of this functional dependency. [6 marks] (b) Are the given two sets of functional dependencies FD1 = {A→C, AC→D, E→AD, E→H} and FD2 = {A→CD, E→AH} are equivalent? [4 marks]	CO4

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