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Enrolment No:	

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
Supplementary Examination, December 2023

Course: Database Management Systems **Semester: I**
Program: BCA **Time: 03 hrs.**
Course Code: CSBC 1012 **Max. Marks: 100**

Instructions: Attempt all questions.

SECTION A
(5Qx4M=20Marks)

S. No.	Question	Ma rks	CO
Q 1	Write about three-schema architecture and the need for mappings between schema levels.	4	CO1
Q2	Define the following: a) Foreign Key b) Multivalued attribute c) MERGE query d) Order by clause	4	CO2
Q3	Give an example of each: a) Delete anomaly b) Update anomaly	4	CO3
Q4	From the following table, write a SQL query to: a) Find the orders, which are delivered by a salesperson of ID. 5001 return ord_no, ord_date, purch_amt. b) Write a SQL query to find the unique salespeople ID. Return salesman_id Sample table: orders ord_no purch_amt ord_date customer_id salesman_id ----- 70001 150.5 2012-10-05 3005 5002 70009 270.65 2012-09-10 3001 5005 70002 65.26 2012-10-05 3002 5001 70004 110.5 2012-08-17 3009 5003 70007 948.5 2012-09-10 3005 5002 70005 2400.6 2012-07-27 3007 5001 70008 5760 2012-09-10 3002 5001	4	CO4
Q5	List the advantages of the database approach over the traditional file system approach.	4	CO1

SECTION B
(4Qx10M= 40 Marks)

Q 6	How can you join a table to itself? Give example and write the related SQL query.	10	CO4
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Q 7	Give an account of various problems of concurrency control along with an example for each stated problem.	10	CO4
Q8	<p>Consider the following relational database schema consisting of the four relation schemas:</p> <p>passenger (pid, pname, pgender, pcity) agency (aid, aname, acity) flight (fid, fdate, time, src, dest) booking (pid, aid, fid, fdate)</p> <p>Answer the following questions using relational algebra queries.</p> <p>a) Get the details about all flights from Chennai to New Delhi. b) Find only the flight numbers for passengers with PID 123 for flights to Chennai before 4/4/2022. c) Find the passenger names of passengers who have bookings on at least one flight. d) Find the passenger names for those who do not have any bookings for any flights. e) Find the agency names for agencies that are in the same city as a passenger with passenger id 123.</p>	10	CO3
Q 9	Explain the desirable properties of the transaction. Also, mention how SQL provides support for transactions.	10	CO4
SECTION-C (2Qx20M=40 Marks)			
Q 10	“The insert operation can violate domain constraint, key constraint, entity integrity constraint, and referential integrity constraint.” Explain. Also, support your explanation with examples.	20	CO3
Q 11	<p>Draw an ER diagram that captures the following information. Identify any constraints that are not captured by the ER diagram. Use only the basic ER model here; that is, entities, relationships, and attributes. Be sure to indicate any key and participation constraints.</p> <p>The Prescriptions-R-X chain of pharmacies has ordered to give you a free lifetime supply of medicines if you design its database. Given the rising cost of health care, you agree. Here's the information that you gather:</p> <ol style="list-style-type: none"> 1. Patients are identified by an SSN, and their names, addresses, and ages must be recorded. 2. Doctors are identified by an SSN. The name, specialty, and years of experience must be recorded for each doctor. 3. Each pharmaceutical company is identified by name and has a phone number. 4. The trade name and formula must be recorded for each drug. Each drug is sold by a given pharmaceutical company, and the trade name identifies a drug uniquely from among the products of that company. If a pharmaceutical company is deleted, you need not keep track of its products any longer. 5. Each pharmacy has a name, address, and phone number. 6. Every patient has a primary physician. Every doctor has at least one patient. 	20	CO2

	<p>7. Each pharmacy sells several drugs and has a price for each. A drug could be sold at several pharmacies, and the price could vary from one pharmacy to another.</p> <p>8. Doctors prescribe drugs for patients. A doctor could prescribe one or more drugs for several patients, and a patient could obtain prescriptions from several doctors. Each prescription has a date and a quantity associated with it. You can assume that if a doctor prescribes the same drug for the same patient more than once, only the last such prescription needs to be stored.</p> <p>9. Pharmaceutical companies have long-term contracts with pharmacies. A pharmaceutical company can contract with several pharmacies, and a pharmacy can contract with several pharmaceutical companies. For each contract, you must store a start date, an end date, and the text of the contract.</p> <p>10. Pharmacies appoint a supervisor for each contract. There must always be a supervisor for each contract, but the contract supervisor can change over the lifetime of the contract.</p>		
	OR		
Q 11'	<p>Consider the following information about a university database:</p> <ul style="list-style-type: none"> • Professors have an SSN, a name, an age, a rank, and a research specialty. • Projects have a project number, a sponsor name (e.g., NSF), a starting date, an ending date, and a budget. • Graduate students have an SSN, a name, an age, and a degree program (e.g., M.S. or Ph.D.). • Each project is managed by one professor (known as the project's principal investigator). • Each project is worked on by one or more professors (known as the project's co-investigators). Professors can manage and/or work on multiple projects. • Each project is worked on by one or more graduate students (known as the project's research assistants). • When graduate students work on a project, a professor must supervise their work on the project. Graduate students can work on multiple projects, in which case they will have a (potentially different) supervisor for each one. • Departments have a department number, a department name, and a main office. • Departments have a professor (known as the chairman) who runs the department. • Professors work in one or more departments and for each department that they work in, a time percentage is associated with their job. • Graduate students have one major department in which they are working on their degree. • Each graduate student has another, more senior graduate student (known as a student advisor) who advises him or her on what courses to take. <p>Design and draw an ER diagram that captures the information about the university. Use only the basic ER model here; that is, entities, relationships, and attributes. Be sure to indicate any key and participation constraints.</p>		