

Name:	
Enrolment No:	

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, May2019

Programme Name: B. Tech. CSE –SPZ-CL/IPR	Semester: II
Course Name : Database Management Systems	Time : 03 Hours
Course Code : CSEG 1005	Max. Marks : 100
Nos. of page(s) : 3	
Instructions: Attempt all questions.	

SECTION A

S. No.		Marks	CO
	Attempt all questions.		
Q 1	Explain the different types of anomalies in database with the help of a suitable example.	4	CO5
Q 2	Differentiate between the centralized and client/ server architecture of DBMS.	4	CO1
Q 3	What is meant by cardinality constraint on relationship types? Explain with an example.	4	CO2
Q 4	Discuss the use of following SQL functions with an example: i) MIN ii) MAX iii) SUM iv) AVG v) COUNT	4	CO4
Q 5	Discuss the constraint that can be violated in delete operation. Support your explanation with an example.	4	CO3

SECTION B

	Attempt all questions.		CO
Q 6	Draw an E-R diagram to illustrate the case given below: A bank has many branches and a large number of customers. A customer can open different kinds of accounts with the bank. The bank keeps track of a customer by his SSN, name, address, and phone number. Age is used as a factor to check whether he is a major. There are different types of loan, each identified by a loan number. A customer can take out more than one type of loan, and all branches can give loans. Loans have a duration and interest rate. The account holder can enquire about the balance in his account. Make Suitable assumptions and use them in showing	10	CO2

	maximum and minimum cardinality ratio.		
Q 7	Discuss the functionality of DB2 components. Also, draw the diagram.	10	CO3
Q 8	Discuss the algorithm for implementing SELECT relational operator and the circumstances under which algorithm can be used in query optimization	10	CO6
Q 9	a) Differentiate between BCNF and 3NF. Why BCNF is considered as a stronger form of 3NF? (5)	10	CO5
	b) Why should NULLs in a relation be avoided as much as possible? Discuss the problem of spurious tuples and how we may prevent it. (5)		
	OR	10	CO5
c) Illustrate how the process of creating first normal form relations may lead to multivalued dependencies. How first normalization should be done properly so that MVDs are avoided. (5)			
	d) What undesirable dependencies are avoided when a relation is in 3NF?(5)		
SECTION-C			
	Attempt all questions		CO
Q10	a)“Database Systems have a self-describing nature and support multiuser transaction processing.” Justify the statement. (10) b) What undesirable dependencies are avoided when a relation is in 3NF? (10)	20	CO1, CO5
Q 11	Write appropriate SQL Statement for the following: (4 marks each) Consider the following table structure and attempt. Supplier-(scode,sname,scity,turnover) Part-(pcode,weigh,color,cost,sellingprice) Supplier_Part-(scode,pcode,qty) i) Create and populate tables. ii) Get the supplier number and part number in ascending order of supplier number. iii) Get the details of supplier who operate from Bombay with turnover 50. iv) Get the total number of supplier. v) Get the part number weighing between 25 and 35?	20	CO4
	OR		
	Implement the following constraints using SQL : (4 marks each) i) Primary Key	20	CO4

	ii) Foreign key iii) Check iv) NOT NULL v) Naming a constraint		
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SECTION A

S. No.		Marks	CO
	Attempt all questions.		
Q 1	Explain the informal quality measures employed for a relational schema design.	4	CO5
Q 2	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	4	CO2
Q 3	Describe three-schema architecture. Why do we need mappings between schema levels?	4	CO1
Q 4	Discuss the relational algebra operators UNION, INTERSECTION and MINUS with suitable example?	4	CO4
Q 5	Which constraints can be violated in an update operation? Give examples.	4	CO3

SECTION B

	Attempt all questions.		CO
Q 6	<p>Consider the following set of requirements for a UNIVERSITY database that is used to keep track of students' transcripts and draw an ER diagram by making suitable assumptions. Specify key attributes of each entity type and structural constraints on each relationship type.</p> <p>(i) The university keeps track of each student's name, student number, social security number, current address and phone, permanent address and phone, birthdate, sex, class (freshman, sophomore, ..., graduate), major department, minor department (if any), and degree program (B.A., B.S., ..., Ph.D.). Some user applications need to refer to the city, state, and zip of the student's permanent address, and to the student's last name. Both social security number and student number have unique values for each student.</p> <p>(ii) Each department is described by a name, department code, office number, office phone, and college. Both name and code have unique values for each department.</p> <p>(iii) Each course has a course name, description, course number, number of semester hours, level, and offering department. The value of course number is unique for each course.</p>	10	CO2

	(iv) Each section has an instructor, semester, year, course, and section number. The section number distinguishes different sections of the same course that are taught during the same semester/year; its values are 1, 2, 3, ...; up to the number of sections taught during each semester. (v) A grade report has a student, section, letter grade, and numeric grade (0, 1, 2, 3, 4).																													
Q 7	Discuss the functionality of DB2 components. Also, draw the diagram.	10	CO3																											
Q 8	Define query optimization. List and explain the steps followed to process high-level query.	10	CO6																											
Q 9	a) What is functional dependency? Explain its significance with respect to first and second normal form.	10	CO5																											
	OR	10	CO5																											
	b) Illustrate how the process of creating first normal form relations may lead to multivalued dependencies. How first normalization should be done properly so that MVDs are avoided. (5) c) What undesirable dependencies are avoided when a relation is in 3NF? (5)																													
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Q 10	a) Explain the usage of menu based and form based DBMS interfaces also specify the type of users for such interfaces. (10) b) Discuss the purpose of BCNF. Illustrate your answer with an example. (10)	20	CO1, CO5																											
	a) Write appropriate SQL Statement for the following: (4 marks each)	20	CO4																											
	<table border="1"> <thead> <tr> <th>Column name</th> <th>data type</th> <th>Size</th> </tr> </thead> <tbody> <tr> <td>PRODUCTNO</td> <td>Varchar</td> <td>6</td> </tr> <tr> <td>DESCRIPTION</td> <td>Varchar</td> <td>15</td> </tr> <tr> <td>PROFITPERCENT</td> <td>Decimal</td> <td>4,2</td> </tr> <tr> <td>UNIT MEASURE</td> <td>Varchar</td> <td>10</td> </tr> <tr> <td>QTYONHAND</td> <td>Integer</td> <td></td> </tr> <tr> <td>REORDERLVL</td> <td>Integer</td> <td></td> </tr> <tr> <td>SELLPRICE</td> <td>Decimal</td> <td>8,2</td> </tr> <tr> <td>COSTPRICE</td> <td>Decimal</td> <td>8,2</td> </tr> </tbody> </table> <p>Table Name: PRODUCT_MASTER Description: used to store product information</p>	Column name	data type	Size	PRODUCTNO	Varchar	6	DESCRIPTION	Varchar	15	PROFITPERCENT	Decimal	4,2	UNIT MEASURE	Varchar	10	QTYONHAND	Integer		REORDERLVL	Integer		SELLPRICE	Decimal	8,2	COSTPRICE	Decimal	8,2		
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	i) Create and populate table.																													

	ii) List the various products available from the Product_Master table. iii) Delete all products from Product_Master where the quantity on hand is equal to 100.. iv) Change the size off SellPrice column in Product_Master to 10, 2. v) Change the name of the Product_Master to prod_mast.?		
	OR		
Q 11	Implement the following comparison conditions, giving examples using SQL (5 marks each) i) Between... and.. ii) IN iii) LIKE and its use to perform wild card searches iv) IS NULL	20	CO4