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P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belagavi)

Fourth Semester, B. E. - Information Science and Engineering

Semester End Examination; July / August - 2022

Database Management System

Time: 3 hrs   *Max. Marks: 100*

Course Outcome's

The Students will be able to:

CO1: Understand and explore the needs and concepts of relational database management, non-relational database, transaction processing and related relational database facilities.

CO2: Apply the knowledge of logical database design principles to real time issues.

CO3: Analyze and design relational and document-based data model concepts.

CO4: Develop applications using Relational database and NoSQL database.

<u>*Note:*</u> *i) **PART-A** is compulsory. One question from each unit for maximum of 2 marks*

*ii) **PART-B**: Answer any **TWO** sub questions (from a, b, c) from each unit for a Maximum of 18 marks.*

Q. No.	Questions	Marks
	I:PART - A	**10**
I a.	Define Data and Database.	2
b.	With example, write syntax for Alter table command.	2
c.	Define functional dependency. Give example.	2
d.	Why BCNF is stronger than 3NF.	2
e.	State the ACID properties of a transaction management.	2
	II:PART - B	**90**
	UNIT - I	**18**
1 a.	Discuss the main characteristics of the database approach and how it differs from traditional file system.	9
b.	Draw an ER-diagram, for airline database schema with atleast five entity types and specify primary key and structural constraints and weak entity type.	9
c.	Define the following terms: i) Weak entity type ii) Degree of a relationship type iii) Role names and recursive relationship	9
	UNIT - II	**18**
2 a.	Consider the order processing database customer (<u>cid</u>, cname, email, addr, phone) item (<u>item-no</u>, item-name, price, brand) sales (cid, item-no. #items, amount, sale-date) supplier (<u>sid</u>, sname, sphone, saddr) supply (sid, itemno. supply_date, qty)	9

Write SQL queries for the following relational schema:

i) List the items purchased by customer "Prashanth"?

ii) Retrieve items supplied by all suppliers starting from 1st Jan 2019 to 30th Jan 2019)

iii) Get the details of customers whose total purchase of items worth more than 5000 rupees

iv) List total sales amount, total items, average sale amount of all items

v) Display customers who have not purchased any items

b. What are the assertions in SQL? Write a SQL program to create an assertion to specify the constraint that the salary of an employee must be not greater than the salary of the department manager.   9

c. Explain aggregate functions with example.   9

UNIT- III   18

3 a. Consider the two tables T_1 and T_2. Show the results of the following operations:

T_1				T_2		
P	Q	R		A	B	C
10	a	5		10	b	6
15	b	8		25	c	3
25	a	6		10	b	5

(i) $T_1 \bowtie_{T_1 P = T_2 A} T_2$

(ii) $T_1 \bowtie_{T_1 Q = T_2 B} T_2$

(iii) $T_1 \rtimes_{T_1 P = T_2 A} T_2$

(iv) $T_1 \ltimes_{T_1 Q = T_2 B} T_2$

(v) $T_1 \bowtie_{(T_1.P = T_2.A \text{ AND } T_1.R = T_2.C)} T_2$

    9

b. Define normal form. Explain 1NF, 2NF, and 3NF with suitable example.   9

c. Discuss insertion, deletion and modification anomalies. Why are they considered bad? Illustrate with example.   9

UNIT- IV   18

4 a. Write down the difference between SQL and NoSQL.   9

b. Explain the different types of NoSQL databases.   9

c. Define the multi valued dependency and join dependency? Explain 4NF and 5NF with examples.   9

UNIT - V   18

5 a. Explain the state transition diagram with neat figure.   9

b. Explain characterizing scheduling by serializability.   9

c. Explain ACID properties in database transaction.   9

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