University of Engineering & Management, Kolkata

Even Semester Term- I Examination, March, 2021

Course: B.Tech (CS) **Semester: 4th**

Paper Name: Database Management Systems

Paper Code: PCCCS403

Full Marks: 70 **Time: 2 hours**

Answer all questions. Each question is of 10 marks.

1. **A)** What is Data Independence and why it is essential? Brief about the architecture of DBMS.

OR

B) What are the different levels of abstraction? Compare the database system with conventional file system.

2. **A)** Draw an ER diagram for University management system using Composite Attributes, Component Attributes, Derived Attributes, Multi Valued Attributes, and Weak Entities etc. .

OR

B) Define Entity set and also defines Relationship set. List and explain the symbols used to draw ER Diagram.

3. **A)** Consider the following database schema to write nested queries in SQL.
Supplier (id, name, city)
Parts(pno, pname, pdescription)
Supply(id, pno, cost)

a) Find the names of the parts supplied by "RamRaj"
b) Find the cost of bolts being supplied by Nagpur suppliers.

OR

B) Define Database Schema and explain it with example. How to define a domain constraint? Give an example.

4. **A) i)** Find the closure based on the FD set: R(ABCDEFG) where, A→B, BC→DE, AEG→G Functional dependencies hold valid,

Find (AC)+ , (ACEG)+ and (ACG)+ .

ii) Check if the FDs are equivalent for a relation R(ABCDEFGH).
FD1{A→C, AC→D, E→AD, E→H} ; FD2{A→CD, E→AH} **[3+7=10]**

OR

B) Differentiate between specialization and generalization. Discuss in detail about the Concepts of E-R model with suitable examples.

5. A) Explain about various constraints used in ER-model. What is meant by existential dependency of an entity set?

OR

B) What is the need of data model in DBMS and give its classification. Explain object oriented data model with example.

6. A) i) State the difference between choosing a super key & a candidate key in a table (use an example table for explanation).

ii) Define RAT rules with respect to Armstrong's axioms. For a relation having the following set of FDs:

R(ABCDEF) : A->B, C->DE, AC->F, D-> AF, E ->CF ; Find the attribute closure of (DE) . **[5+5=10]**

OR

B) i) For a given relation R (ABCD), check for the equivalence of the following set of FDs: FD1 = {A->B, B->C, AB->D} and FD2 = {A->B, B->C, A->C, A->D}

ii) For the following table,

X	Y	Z
1	4	2
1	5	3
1	6	3
3	2	2

State which of the following FDs stand valid:

1. XY -> Z && XZ -> Y
2. YZ -> X && Y -> Z
3. YZ -> X && X -> Z
4. XZ -> Y && Y -> Z **[6+4=10]**

7. A) what are the different data models present and explain those briefly. What is Data Base Administrator? Discuss the functions of DBA.

OR

B) What are the major components used in E-R diagram design? How to represent a weak entity set in ER diagram? Quote suitable example.

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