B. E. Fifth Semester (Computer Technology) / SoE–2014-15 Examination

Course Code : CT 1316/CT 316 **Course Name : Database Management System**

Time : 3 Hours] [Max. Marks : 60

Instructions to Candidates :—

(1) All questions are compulsory.
(2) All questions carry marks as indicated.
(3) Due credit will be given to neatness.

1. Solve the following :

(A1) What do you understand by "Total participation and Partial participation" brief it with the help of ER diagram of Banking System. 6(CO1)

(A2) DBA plays an important role in managing database system. Comment on it. 2(CO1)

(A3) State the real life applications of DBMS. 2(CO1)

OR

Solve the following :

(B1) Draw and describe the components of "Database System Architecture". 6(CO1)

(B2) Discuss about Logical Independence. 2(CO1)

(B3) Elaborate the disadvantages of conventional file–based system compared to Database Management System. 2(CO1)

2. (A1) Consider the following tables :

Employee(Emp_no, Name, Emp_city) **Contd.....**

Company(Emp_no, Company_name, Salary)

(i) Write a SQL query to display Employee name and company name.

(ii) Write a SQL query to display employee name, employee city, company name and salary of all the employees whose salary>10000.

(iii) Write a query to display all the employees working in 'XYZ' company. 6(CO1)

(A2) Compare DDL and DML commands. 2(CO1)

(A3) With an example describe referential integrity. 2(CO1)

OR

Solve the following :

(B1) Consider the following table 1 and table 2.

Table–1

Emp		
Empid	**Empname**	**Deptname**
S01	Manisha	Finance
S02	Anisha	Sales
S03	Nisha	Finance

Table–2

Dept	
Deptname	**Manager**
Finance	Arun
Sales	Rohit
Production	Kishan

Perform the Cartesian Product and Natural Join operation of Relational Algebra, show the resultant tables. 6(CO1)

(B2) With the help of ER diagram, describe weak entity in it. 2(CO1)

(B3) Compare Specialization and Generalization in E–R diagram. 2(CO1)

3. Solve the following :

(A1) Normalize (decompose) following relation into lower to higher normal form. (From 1NF to 3 NF)

PLANT	MANAGE	MACHINE	SUPPLIER_NAM	SUPPLIER_C
Plant–A	Ravi	Lathe, Boile	Jay industry Abb appliance	Ahmedabad, Surat
Plant–B	Meena	Cutter, Boiler, CNC	Raj machinery, Daksh industry, Jay industry	Vadodara, Rajkot, Ahmedabad

6(CO2)

(A2) List and describe Armstrong's Axioms. 2(CO2)

(A3) Suppose a relation R is given with attributes A, B, C, G, H and I. Also, a set of functional dependencies F is given with following FDs.
F = {A→B, A→C, CG→H, CG→I, B→H}
Find Closure of F. List all possible candidate keys. 2(CO2)

OR

Solve the following :

(B1) Calculate the average no. of blocks to be searched to find required block in Primary Indexing method (with and without Index file) by using given data. Main file: (Block size: 1024 B, Record Size:100 B.No. of Records:30000), Index File:(Record Size:15 B) 6(CO2)

(B2) Compare Lossy and Lossless decomposition of relational schema. 2(CO2)

(B3) What is an anomaly in database design ? How it can be solved ? 2(CO2)

4. Solve the following :

(A1) What is transaction ? List and elaborate ACID property of transaction with example. 6(CO3)

(A2) When can you say that "Transaction is partially comitted" in transaction processing? 2(CO3)

(A3) What do you mean by "Dirty Read Problem", support your answer with example ? 2(CO3)

OR

Solve the following :

(B1) Compare serial and Non serial schedule with the help of example, also comment on "A schedule S is conflict serializable if it is conflict equivalent to a serial schedule." considering one example. 6(CO3)

(B2) Brief the concept of "shared lock" and "exclusive lock" in Lock Based protocol. 2(CO3)

(B3) Comment on "Strict Two Phase Locking Protocol" and Rigorous Two Phase Locking Protocol". 2(CO3)

5. Solve the following :

(A1) How can you restore database by using "Immediate Database Modification log based recovery method." Discuss it with proper example. 6(CO4)

(A2) How query processing can be done ? Explain it with example. 2(CO4)

(A3) "Materialization method can be used for the evaluation of expression." Brief it with example. 2(CO4)

OR

Solve the following :

(B1) "Shadow paging is an alternative to transaction–log based recovery techniques". Explore this statement with proper example. 6(CO4)

(B2) Discuss the pipelining method in query evaluation. 2(CO4)

(B3) Write the steps of Binary search scan algorithm to implement the selection operation. 2(CO4)

6. (A1) A car–rental company maintains a vehicle database for all vehicles in its current fleet. For all vehicles, it includes the vehicle identification number, license number, manufacturer, model, date of purchase, and color. Special data are included for certain types of vehicles :

- Trucks : cargo capacity
- Sports cars : horsepower, renter age requirement
- Vans: number of passengers
- Off–road vehicles:ground clearance, drivetrain (four–or two–wheel drive)

Construct an object–oriented database schema definition for this database. Use inheritance where appropriate. 6(CO4)

(A2) How does the concept of an object in the object–oriented model differ from the concept of an entity in the entity–relationship model ? 2(CO4)

(A3) Why do persistent programming languages allow transient objects ? Might it be simpler to use only persistent, objects with unneeded objects deleted at the end of an execution ? Explain your answer. 2(CO4)

OR

Solve the following :

(B1) Discuss The characteristics and merits of object oriented databse. 6(CO4)

(B2) If an object is created without any references to it, how can that object be deleted ? 2(CO4)

(B3) Why ambiguity potentially exists with multiple inheritance. Illustrate your explanation with an example. 2(CO4)