UKA TARSADIA UNIVERSITY

BCA/Integrated M.Sc. (IT)/MCA (Integrated) (1stSemester)

Subject :030010102/060010102/060060102-Database Management Systems (Theory)

Time : **10 a**m to **1** pm Date : **24/12/**20**14**

Duration : 3Hours **Max. Marks: 60.**

Instructions:

1. Attempt all questions.
2. Write each section in a separate answer book.
3. Make suitable assumptions wherever necessary.
4. Figures to the right indicate full marks allocated to that question.
5. Draw diagrams/figures whenever necessary.

SECTION - 1

Q-1 (A) Answer the following. **[04]**

I) Define: DBMS

II) Which file structure is more efficient when we have more frequent search operation compared to insertion?

III) What is data model?

IV) Draw diagram of two tier architecture of DBMS.

Q-1 (B) Answer the following in brief. (Any 3) **[06]**

I) What is data dictionary? Which kind of information is stored in data dictionary about relation?

II) List two advantages of using unordered file.

III) How total participation constraint is denoted? Which is other type of participation constraint?

IV) State four responsibilities carried out by database administrator.

Q-2 Answer the following. **[10]**

A) Design E-R diagram for an airline management system. The database must keep track of customers and their reservations, seat assignments and flight and their status. One seat is allocated to only single passenger. Also store information about schedule containing source, destination, arrival time, departure time of flight.
Draw an Enhanced ER diagram that shows the entity sets, attributes, relationships, and participation constraints for this application. State any assumptions you make.

OR

A) Which entity set can be considered as weak entity set? Validate your reasons by giving proper example. Show representation of weak relationship set and discriminator.

B) Design a generalization-specialization hierarchy for motor vehicle sales company. The company sells motorcycles, passenger cars, vans, and buses. Justify your placement of attributes at each level of the hierarchy. Explain why they should not be placed at a higher or lower level.

OR

B) Hospital has many doctors hired to treat the patient. Doctors are specialized as surgeon, dentist and neurologist. They treat for various kinds of diseases and perform various kinds of operations if necessary. Medicines are prescribed to each patient by a doctor. Construct E-R diagram for the above scenario and also show mapping cardinalities exist between relationship set and entity set. Mention any assumption you make.

Q-3 Answer the following in detail. (Any 2) **[10]**

A) What is data abstraction? Explain three levels of data abstraction.

B) Show hierarchy of physical storage media on basis of their cost and speed. Explain characteristics of any one media in brief.

C) List four disadvantages of conventional file system. Explain any two in brief.

SECTION – 2

Q-4 (A) Answer the following. **[04]**

I) State the objective of normalization.

II) Consider the table: Movie(Movie_id, Name, Director, Actor)
Identify prime attribute and non-prime attributes from above table.

III) Define: First Normal Form

IV) Specify names of any two logical operators.

Q-4 (B) Answer the following in brief. (Any 3) **[06]**

I) State any four E.F. Codd rules.

II) Which are pattern matching operators? Explain any one with example.

III) When does GROUP BY clause is use? Give one example.

IV) List any six data types available in DB2.

Q-5 Answer the following. **[10]**

A) Consider the following tables:
Employee(Emp_ID, Emp_Name, City, Salary, DeptID)
Department(Dept_ID, Dept_Name, Total_Emp)
Write a query to perform following task.
   i. Modify City to 'Bombay' of employee whose salary>9000 and City is 'Surat'.
   ii. Add a field Establishment_Year in Department.

OR

A) Consider the above Employee and Department table and write a query to perform following task.
   i. Delete Employee who lives in "Surat". 1 mark
   ii. List detail of employees whose name begin with "A" and belong to dept_id '004'. 2 marks
   iii. Display Emp_Name and Dept_Name of employee whose salary is greater than 10000. 2 marks

B) Given a relation R=(A, B, C, D, E) is decomposed into R1=(A, B, C) and R2=(A, D, E) and given set of functional dependency are A → BC and A → DE.
Prove with example that decomposition is lossless.

OR

B) Normalize the given relation Doctor upto third normal form.
Doctor(Doc_Id, Doc_Name, Degree, Specialization, Pateint_id, appointment_date)
Set of functional dependencies:
Doc_Id → Doc_Name, Degree, specialization
Doc_Id, appointment_date → Patient_id
Degree → Specialization

Q-6 Answer the following in detail. (Any 2) **[10]**

A) State two advantages of normalizing a relation. Explain second normal form with suitable example.

B) Explain lossy decomposition with example.

C) Enlist any four aggregate functions. Explain any two with example.