

CHAROTAR UNIVERSITY OF SCIENCE & TECHNOLOGY

Third Semester of B. Tech. Examination (CE/IT)

November – December 2011

CE/IT 201 Database Management System

Date: 03.12.2011, Saturday

Time: 01:30 p.m. To 04:30 p.m.

Maximum Marks: 70

Instructions:

1. The question paper comprises of two sections.
2. Section I and II must be attempted in separate answer sheets.
3. Make suitable assumptions and draw neat figures wherever required.
4. Use of scientific calculator is allowed.

SECTION - I

- Q - 1 (a) Draw and explain the structure of Database System. [05]
- (b) Explain the following terms: [02]
- 1) weak entity set
 - 2) Data Materialization
- Q - 2 (a) Construct an E-R diagram which generate mark sheet for students. [05]
- (b) Explain generalization and specialization in E-R model with example. [05]
- (c) Explain the types of database users. [04]

OR

- Q - 2 (a) Construct an E-R diagram for university registrar's office maintains following data. [05]
- 1) course including number, credit, syllabus
 - 2) course offering including course number, year, sem, instructor
 - 3) students including std_id, name, program
 - 4) instructor including ins_id, name, dept, title
- (b) Explain the disadvantages of File processing system in detail. [05]
- (c) Explain Aggregation in E-R model with example. [04]
- Q - 3 (a) Find the canonical cover / irreducible set for following FD. [04]
- AB → C
C → A
BC → D
ACD → B
BE → C
CE → FA
CF → BD
D → EF
- (b) Explain the difference between 3NF and BCNF with example. [05]
- (c) Consider the following database : [05]
- Emp (empno, ename, mgr, job, hiredate, comm, sal, deptno)
Dept (deptno, dname, loc)
- Give an expression in SQL for each of the following queries:
- 1) Find the lowest salary of each department
 - 2) List all the employees whose names begin with 'A' and display it in descending order. [1]
[2]
 - 3) Find the name and salary of employees whose job is 'Manager' and location is 'London'. [2]

OR

Q - 3 (a) Find the canonical cover / irreducible set for following FD. And show, are they equivalent? [04]

1. $A \rightarrow B$ $AB \rightarrow C$ $D \rightarrow AC$ $D \rightarrow E$
2. $A \rightarrow BC$ $D \rightarrow AE$

(b) What is normalization? Explain 1NF & 2NF in brief. [05]

(c) Consider the following database : [05]
customer (cust_no, cust_name, state, phone_no)
Item (item_no, item_name, price, QoH)
Invoice (invno, invdate, cust_no)

Give an expression in Relational Algebra expression for the following queries:

- 1) Find the names of all customers who have invoice number '13'. [2]
- 2) Find the item number for each item having price greater than 1000 and less than 5000. [2]
- 3) Rename the customer relation with all its attributes. [1]

SECTION – II

Q - 4 (a) Draw and explain the state diagram of transaction in detail. [03]

(b) Write a short note on two-phase locking protocol in brief. [04]

Q - 5 (a) Explain conflict serializability with example. [05]

(b) Explain mandatory access control in detail. [05]

(c) Explain the following terms with example: [04]
1) commit 2) rollback

OR

Q - 5 (a) Explain the steps of query processing with diagram. [05]

(b) Explain Intent Locking in detail. [05]

(c) Explain various types of failure in database system. [04]

Q - 6 (a) Explain log based recovery in detail. [08]

(b) Explain any six aggregate functions in SQL with example. [06]

OR

Q - 6 (a) Explain data encryption with example. Explain public key encryption with example. [08]

(b) Write down the syntax for the following operations in SQL: [06]

- 1) How to create new table from existing table?
- 2) How to rename a particular column of a table?
- 3) How to delete a single record out of duplicate records in database?
