00268

BICS-011

B.Tech. – VIEP – COMPUTER SCIENCE AND ENGINEERING (BTCSVI)
Term-End Examination
December, 2015

BICS-011 : DATABASE MANAGEMENT SYSTEM

Time : 3 hours   *Maximum Marks : 70*

Note : *Attempt any* **seven** *questions. All questions carry equal marks.*

1. (a) What are the disadvantages of DBMS as compared to file processing systems ? Explain in detail.   5

   (b) What are the different subsystems in DBMS architecture ?   5

2. (a) What do you mean by mapping cardinalities ? Explain various types of cardinalities.   5

   (b) When should we use weak entities while modelling a database ?   5

3. Given the relational schema :

sales_person (ssn, name, start_yr, dept_no)

trip (ssn, trip_id, from_city, to_city,
    departure_date, return_date)

expense (trip_id, account_no, amount)

dept (dept_no, dept_name)

Write the relational algebra for the following queries : $4 \times 2\frac{1}{2} = 10$

(a) Find the most expensive and least expensive trip.

(b) Find the average expenditure of trips involving the amount more than ₹ 2,000.

(c) Find the department of the person spending maximum amount on a trip.

(d) Find the person going maximum number of times on trips.

4. (a) Explain the rules for decomposing a relation. *5*

(b) Given the relation schema R(A, B, C, D) and a functional dependency

FD = { A → B,

    B → C,

    C → (B, D)}.

(i) What is candidate key ?

(ii) What normal form is it in ? Explain. $2 \times 2\frac{1}{2} = 5$

5. (a) What is log-based recovery ? How is it different from shadow paging ?   *5*

(b) How can a non-serializable schedule be changed into a serializable schedule ?   *5*

6. (a) Discuss the atomicity and concurrency in databases.   *5*

(b) What is database protection ? How is it achieved ? What are its advantages ?   *5*

7. Construct an ER diagram for a Library Management System keeping record of the following information :

(a) Books

(b) Members

(c) Fine

(d) Publisher

(e) Book Bank

List all the assumptions you make about the database and mapping constraints.   *10*

8. Write short notes on any *two* of the following :   *2×5=10*

(a) Generalization

(b) Cascading Schedules

(c) View