15612

MCA 3rd Semester Examination

Database Management System (NS)

MCA-301

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

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Attempt five questions in all, selecting one question from the sections A, B, C and D. Section E is compulsory.

SECTION - A

1. (a) What do you mean by DBMS architecture? Explain. (6)

    (b) Explain the components of DBMS.   (6)

2. (a) What are the different file organization techniques? Explain the advantages and disadvantages of Index sequential file organization   (8)

    (b) Explain the difference between hierarchical and network model.   (4)

SECTION - B

3. (a) What do you mean by Relational algebra? Explain the following operations in relational algebra with the help of examples:

    (i) Selection   (ii) Projection

    (iii) Union   (iv) Intersection   (8)

    (b) Explain the different anomalies in database.   (4)

[P.T.O.]

4. Consider the following relation:

    Emp (ecode, ename, dept, address, city, sex, salary)

    Write SQL statements for the following:

    (i) List the employees of production dept having salary more than 20,000.

    (ii) List ename, address and sex of employees working either in servicing or marketing dept.

    (iii) List ecode, ename, dept of employees having ecode 1005,1009,1011 and 1015.

    (iv) List the employees who live in city Shimla, Ludhiana, Jalandhar or Ahmedabad.   (12)

SECTION - C

5 (a) Explain the concept of serializability in concurrency control with the help of example.   (6).

    (b) Explain the two phase locking protocol.   (6)

6. (a) What is deadlock? What is the purpose of wait for graph in deadlock detection?   (6)

    (b) What is database security? Explain the different defense mechanisms.   (6)

SECTION - D

7. (a) Explain the following terms with respect to DDBMS:

    (i) Fragmentation   (ii) Replication   (6)

    (b) Explain the different applications of DDBMS.   (6)

8. (a) Explain the difference between homogeneous and heterogeneous systems.   (6)

    (b) Explain the DDBMS architecture with the help of diagram.   (6)

SECTION - E

9. Do as directed:

    Fill in the blanks:

    (a) The logical structure of database is sometime called
         _____.

    (b) In E-R diagram, relationship is depicted by _____
         symbol.

    (c) _____ is the language used to grant and revoke
         authorization for database.

    (d) _____ is used to change the structure of database.

    (e) The _____ clause allows removing duplicated
         from the result set.

    (f) The set of all possible values that an attribute can have
         is called _____.

    Define the following:

    (g) Relation.

    (h) Attribute.

    (i) Primary key.

    (j) Foreign key.

    (k) Cardinality.

    (l) Weak entity.   (1×12=12)