PG/IIIS/MCA-301/18

MCA 3rd Semester Examination, 2018

MCA

(*Database Management System*)

PAPER – MCA-301

Subject Code – 32

Full Marks : 100

Time : 3 hours

Answer **Q.No.1** and any **four** from the rest

The figures in the right hand margin indicate marks

Candidates are required to give their answers in their own words as far as practicable

Illustrate the answers wherever necessary

1. Answer the following questions (any *five*) : 2×5

(*a*) Choose correct alternative from following for $R = \{J, K, L\}$, $F = \{JK \rightarrow L, L \rightarrow R\}$ the

candidate keys are

(*i*) J and K

(*ii*) JK

(*iii*) Only J

(*iv*) JK and JL

(*b*) What is cascading roll back ?

(*c*) Give an example of security features in DBMS.

(*d*) "A Super Key is always a candidate key" true or false ? Justify.

(*e*) Define foreign key with example.

(*f*) Write advantages of database management system over file processing system.

(*g*) Whether view occupies any memory space or not ? Justify.

(*h*) What is lossless decomposition ?

(*i*) Differentiate BCNF and 3 NF.

2. (*a*) Discuss the 'insertion anomalies', 'updation anomalies' and 'deletion anomalies' with respect to normal forms with suitable example and suggest a method to overcome them. 7

(*b*) Why a relation that is in 3 NF generally considered good although BCNF is stronger than 3 NF ? 3

(*c*) Explain the terms 'Fully Functional Dependency' and 'Multivalued Dependency' with example. 5

3. (*a*) Draw an ER diagram for a travel agency consisting of following :

Customers, buses, drivers, conductors, guides, tickets, booking, agents, reservations, conducted tours and hotels. 7

(*b*) Describe entities, attributes, relationships and primary keys. 4

(*c*) Reduce the ER diagram into relational schema by defining all the constraints and assumptions. 4

4. Write short notes on following topics (any *three*) : 5 × 3

(*i*) Time stamping

(*ii*) Many to one relationship

(*iii*) Relational Calculus

(*iv*) Generalization

(*v*) Serializability

(*vi*) Indexing.

5. Consider the following relations for a database that keeps track of business trips of salesperson in a sales office :

SALESPERSON (SSN, Name, Start_ Year, Dept_No)

TRIP (SSN, From_City, To_City, Departure_Date, Return_Date, Trip ID)

EXPENSES (Trip ID, Account #, Amount)

Specify the following queries in either relational algebra or in SQL :

(*a*) Give the details (all attributes of TRIP relation) for trip that exceeded Rs. 2,000 in expenses.

(*b*) Print SSN of salesman who took trips to 'Andaman'.

(*c*) Find total expenses of 'Andaman' trip. 15

6. (*a*) Why is normalization done ? Describe its drawbacks. 2 + 2

(*b*) Describe ACID properties of a transaction. 4

(*c*) In a concurrent schedule, when do two instructions conflict ? 4

(*d*) Define 4 NF. 3

7. (*a*) Write the disadvantages of DBMS. 3

(*b*) What is Relationship ? What is degree of a relation ? 3

(*c*) How do you communicate with an RDBMS ? 2

(*d*) What is a Composite Key ? 2

(*e*) Draw an ER diagram for LPG booking system. 5

[*Internal Assessment* : 30 Marks]