2018

(4th Semester)

COMPUTER SCIENCE

Paper No. : COMPT–401

(Database Management System)

(Theory)

Full Marks : 70 *Pass Marks* : 45%

Time : 3 hours

(PART : B—DESCRIPTIVE)

(*Marks* : 45)

The figures in the margin indicate full marks for the questions

1. What is a database? Explain the characteristics of DBMS. What are the three levels of DBMS architecture? 1+4+4=9

Or

Discuss the functions of a database administrator. What are the different database states? What is data independence? 4+3+2=9

2. Explain any three data models. Illustrate the various components used in an E-R model with diagrams. 6+3=9

Or

What are the Codd's rules? Explain cardinality. What are the different types of key in a database? 3+3+3=9

3. Explain the various relational algebra operators with suitable examples. What is functional dependency? 7+2=9

Or

Explain 1NF, 2NF, 3NF and BCNF with examples. What are the consequences of a bad database design? 7+2=9

4. Explain DDL and DML commands in detail with examples. How are SQL constraints added in a query? Describe the various joins. 4+2+3=9

Or

Consider the following table :

Employee (Emp_Name, Dept_Name, Salary)

(a) List the employee names that get the lowest salary.

(Continued)

(b) List the employee names for all employees who work for Sales Department and earn more than ₹ 25,000.

(c) List the department names where more than 60 employees work. 3+3+3=9

5. Describe the different sections of a PL/SQL block with a diagram. Explain triggers with suitable examples. What are the data types used in PL/SQL? 4+3+2=9

Or

Illustrate with examples how functions differ from stored procedures. Explain the various types of cursor. 6+3=9

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COMPUTER SCIENCE

Paper No. : COMPT–401

(Database Management System)

(Theory)

(PART : A—OBJECTIVE)

(*Marks* : 25)

The figures in the margin indicate full marks for the questions

Put a Tick (✓) mark against the correct answer in the brackets provided : 1×10=10

1. The separation of the data definition from the program is known as

(a) data dictionary ( )

(b) data independence ( )

(c) data integrity ( )

(d) referential integrity ( )

2. The property (or set of properties) that uniquely defines each row in a table is called the

(a) identifier ( )

(b) index ( )

(c) primary key ( )

(d) symmetric key ( )

3. Which of the following languages is used to define the schema of the database?

(a) DCL ( )

(b) DDL ( )

(c) DML ( )

(d) None of the above ( )

4. Which of the following are valid table constraints?

I. Primary key

II. Unique

III. Check

IV. Foreign key

(a) I and IV ( )

(b) II and III ( )

(c) I, III and IV ( )

(d) All of the above ( )

5. Typically, a database management system is managed by a person called a

(a) system manager ( )

(b) technology manager ( )

(c) database manager ( )

(d) database administrator ( )

6. The rule that a primary key cannot have a null value, and if the primary key is a composite key, none of the component fields can contain a null value is referred to as

(a) referential integrity ( )

(b) domain integrity ( )

(c) entity integrity constraint ( )

(d) a data validation constraint ( )

7. A/An _____ relationship has an associative entity with its own characteristics.

(a) 1 : 1 ( )

(b) M : N ( )

(c) 1 : M ( )

(d) All of the above ( )

8. Functions are very powerful features of SQL and can be used to do

(a) perform calculations on data ( )

(b) manipulate output for groups of rows ( )

(c) format dates and numbers for display ( )

(d) All of the above ( )

9. When you need to display all the possible combinations of rows from multiple tables, we use

(a) outer join ( )

(b) self-join ( )

(c) Cartesian product ( )

(d) non-equijoin ( )

10. You can change a column's data type, size and default value by using

(a) alter statement ( )

(b) modify statement ( )

(c) resize statement ( )

(d) None of the above ( )

State whether the following statements are *True (T)* or *False (F)* by putting a Tick (✓) mark : 1×5=5

11. A primary goal of a database system is to share data with multiple users.

(T / F)

12. The rule that requires that a foreign key value cannot be entered in one table unless it matches an existing primary key in another table is called entity constraint.

(T / F)

13. Projection operation is used if we are interested in only certain columns of a table.

(T / F)

14. In a hierarchical model, records are organized as links.

(T / F)

15. View is a database object that physically exists.

(T / F)

Answer any *five* of the following questions in short : 2×5=10

16. Who are the database users?

17. What do you mean by degree of a relation?

18. What is a subquery?

19. What is normalization?

20. What are aggregate functions?

21. Mention the different types of attribute.

22. What is the difference between a base-table and a view?

23. How is SQL different from PL/SQL?

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