BRAINWARE UNIVERSITY

Term End Examination 2018 - 19

Programme – Bachelor of Science (Honours) in Computer Science

Course Name – Database Management Systems

Course Code – BCS401

(Semester – 4)

Time allotted:3 Hours **Full Marks : 70**

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group –A

(Multiple Choice Type Question) 10 x 1 = 10

1. *Choose the correct alternative from the following*

(i) Normalization follows

a. Top Down Approach
b. Bottom Up Approach
c. Both 1 & 2
d. None of These

(ii) DML is provided for

a. description of logical structure of database
b. addition of new structures in the database system
c. manipulation & processing of database
d. definition of physical structure of database system

(iii) Which is not a function of DBA?

a. Schema definition
b. Granting of authorization for data access
c. Designing security
d. Definition of triggers

(iv) Which one of the following is true about domains in SQL?

a. SQL domains are user-defined data types
b. SQL domains must be used in data definition
c. SQL domains provide strong typing
d. SQL domains are only synthetic shorthand for system-defined data type

(v) Which one of the following is correct?

a. All functional dependencies are many-to-many relationships
b. All functional dependencies are many-to-one relationships
c. All functional dependencies are one-to-one relationships
d. None of these

(vi) In relational model, degree of a relation is

a. No. of rows
b. Schema
c. No. of attributes
d. No. of key attributes

(vii) For R = { J, K, L } F = { JK –>L L –> K } , the candidate keys are

a. J and K
b. JK
c. Only J
d. JK and JL

(viii) Which of the following problems do concurrency controls deal with?

a. Lost updates
b. Inconsistent retrievals
c. Uncommitted dependency
d. All of these

(ix) Which of the following is true?

a. A super key is always a candidate key
b. Every 3NF schema is also in BCNF
c. Generalization is a bottom-up design approach
d. None of these

(x) A transaction is said to be atomic, if and only if

a. transaction is partially completed
b. transaction is fully completed
c. transaction does not take place
d. none of these

Group – B

(Short Answer Type Questions) 3 x 5 = 15

Answer any *three* from the following

2. Indicate the advantage of DBMS over conventional file system. [5]
3. What is the significance of Null values in SQL? Describe briefly. [5]
4. (a) What is 2-phase locking protocol? [2]
   (b) How does it guarantee serializability? [3]
5. Briefly discuss the ACID properties of transaction in DBMS. [5]

6. Write SQL statements on the following tables:
SALESPEOPLE (snum, sname city, commission)
CUSTOMERS (cnum, cname, city, rating, snum)
ORDERS (onum, amt, odate, cnum, snum)
   (a) Show the commissions of all the salespersons who receive at least one order of amount greater than Rs. 5,000 [2.5]
   (b) Find all the customers located in cities where salesperson 'Amit' has customers [2.5]

Group – C

(Long Answer Type Questions) 3 x 15 = 45

Answer any *three* from the following

7. (a) Explain the terms candidate key, primary key, foreign key and super key. [5]
   (b) Why BCNF is considered as stronger than 3NF? Explain with suitable example. [5]
   (c) How can you define metadata and data dictionary?

8. (a) What is Functional Dependency? Describe with example. [5]
   (b) What is Tuple Relational Calculus? Describe with suitable example. [5]
   (c) What is the difference between Relational Integrity Constraint & Referential Integrity Constraint with examples? [5]

9. (a) What is lossless decomposition? Describe with suitable example. [5]
   (b) Suppose that we decompose the schema, R = (A, B, C, D) into (A, B, C) and (A, D, E). Show that this decomposition is lossless decomposition, if the following set F of FDs holds — A--> BC, CD--> E, B-->D, E-->A. [10]

10. (a) What are the different phases of 2-Phase Locking Protocol? [4]
   (b) Briefly describe different characteristics of Functional Dependency (FD). [4]
   (c) What is database trigger? [3]
   (d) Write a program using database trigger. [4]

11. Write down short notes on *any three* of the following:- [3X5]
   (a) Data Independence in DBMS
   (b) Join Operation
   (c) Stored Procedure in PL/SQL
   (d) Spurious & Dangling Tuples
   (e) Concurrency Control
