Reg. No. : | | | | | | | | | | |

Question Paper Code: 53206

B.E. / B.Tech. DEGREE EXAMINATION, DEC 2020

Third Semester

Computer Science and Engineering

15UCS306 – DATABASE SYSTEM CONCEPTS

(Regulation 2015)

Duration: 1.15 hrs Maximum: 30 Marks

PART A - (6 x 1 = 6 Marks)

(Answer any six of the following questions)

1. Department (dept name, building, budget) and Employee (employee_id, name, dept name, salary) Here the dept_name attribute appears in both the relations. Here using common attributes in relation schema is one way of relating _____ relations. CO1- R

   (a) Attributes of Common (b) Tuple of common

   (c) Tuple of distinct (d) Attributes of distinct

2. Data Models: A collection of tools for describing CO1-R

   (a) Data relationships (b)Tools to modify data

   (c)Data constraints (d) User Interface to modify data

3. Which forms has a relation that possesses data about an individual entity: CO2- R

   (a) 2NF (b) 3NF (c) 4NF (d) 5NF

4. Identify the valid data-types, which can be used in SQL to define the type of data. CO2-U

   (a) varchar (b) string (c) real (d) float

5. Which of the following protocols ensures conflict serializability and safety from deadlocks? CO3- R

   (a) Two-phase locking protocol (b) Time-stamp ordering protocol

   (c) Graph based protocol (d) None of the mentioned

6. Locking may cause which of the following problem CO3-U

(a) Erroneous update (b) Deadlock (c)Versioning (d) Transaction log

7. The RAID level which mirroring is done along with stripping is CO4- R

(a) RAID 1+0 (b) RAID 0 (c) RAID 2 (d) Both RAID 1+0 and RAID 0

8. Choose the correct option about the indexing of a file in database. CO4-R

(a) It can have only one clustered index with multiple secondary indexes

(b) It can have multiple clustered indexes.

(c) It can have both a primary and a clustered index.

(d) All of the above.

9. Which is a join condition contains an equality operator: CO5- R

(a) Equijoins (b) Cartesian

(c) Both Equijoins and Cartesian (d) None of the mentioned

10. The time for repositioning the arm is called_____ CO5- R

(a) Average Time (b) Seek Time

(c) Latency time (d) access time

PART – B (3 x 8= 24 Marks)

(Answer any three of the following questions)

11. Develop a ER Model for a vehicle insurance company whose customers own one or more vehicles each. Each vehicle has associated with it zero to any number of recorded accidents. Each insurance policy covers a maximum of two vehicles, and payment associated with it. Payment of insurance is for a period of two years and has associated due date. CO1- App (8)

12. Let R = (A,B) and S = (A,C), and let r(R) and s(S) be relations. Write an expression in SQL for each of the queries below: CO2- App (8)
a. $\{< a > \mid \exists\, b\ (<a,b> \in r \wedge b = 17)\}$
b. $\{< a, b, c > \mid <a,b> \in r \wedge <a,c> \in s\}$
c. $\{< a > \mid \exists\, c\ (<a,c> \in s \wedge \exists b_1, b_2\ (< a,b_1> \in r \wedge < c, b_2> \in r \wedge b_1 > b_2))\}$

13. Suppose that we decompose the schema R = (A, B, C, D, E) into CO3- Ana (8)
(A, B, C)
(A, D, E)
a. Show that this decomposition is a lossless-join decomposition if the following
set F of functional dependencies holds:

$A \rightarrow BC$
$CD \rightarrow E$
$B \rightarrow D$
$E \rightarrow A$

14. Construct a B^+-tree for the following set of key values: CO4- U (8)
(2, 3, 5, 7, 11, 17, 19, 23, 29, 31)
Assume that the tree is initially empty and values are added in ascending order. Construct B^+-trees for the cases where the number of pointers that will fit in one node is as follows:
(a) Four
(b) Six
(c) Eight

15. Elucidate aggregation operations with a neat example CO5- U (8)

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