No. of Printed Pages : 05

Following Paper ID and Roll No. to be filled in your Answer Book.

PAPER ID : 1112 | Roll No.

BCA Examination 2018-19

(Third Semester)

DATA BASE MANAGEMENT SYSTEM

Time : Three Hours]   *[Maximum Marks : 100*

Note :— Attempt all questions.

1. Attempt any four parts of the following :   4×5=20

   (a) What is the concept of data independence and explain its importance in database environment.

   (b) Explain about external, conceptual and internal schemes.

   (c) What are the advantages and disadvantages of using a database management system?

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(d) What is a Data Model? What is the relational data model? What is data independance and how does a DBMS support it?

(e) Draw the architecture of a DBMS and briefly explain functions of each components.

(f) Explain the different roles of a database administrater, application, programmers and end users of a database.

2. Attempt any four parts of the following : $4 \times 5 = 20$

(a) Explain various integrity rules in relational data model.

(b) Define the terms relation, cardinality and relation degree with an example.

(c) Show how you may specify the following relational algebra operations in both tuple and domain calculus :

(i) $\sigma_A = C (R (A, B, D))$

(ii) $R (A, B, C) - S (A, B, C)$

(d)   What is meant by Cursors? Explain with suitable example.

(e)   Explain the advantages of triggers with suitable examples.

(f)   What are different aggregate functions used in SQL? Explain at least two with the help of examples.

3.   Attempt any four parts of the following : $4 \times 5 = 20$

(a)   Given the relation R (A B C D E F) with the set

$$H = \{A \rightarrow C E, B \rightarrow D, C \rightarrow A D E, B D \rightarrow F\}$$

find the closure of BCD.

(b)   What is the functional dependency? List all functional dependencies satisfied by R given below :

A	B	C
a_1	b_1	c_1
a_1	b_1	c_2
a_2	b_1	c_1
a_2	b_1	c_3

(c)   Explain why 4NF is a normal form more desirable than is BCNF.

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(d) Compute the closure of the following set F for relational schema :

$$R = (A, B, C, D, E)$$

$$F = \{A \to BC, CD \to E, B \to D, E \to A\}$$

Also list the candidate keys of R.

(e) Discuss the advantage and disadvantage of representing hierarchical structured data from the real world as unnormalized relation.

(f) For relation schema R (A, B, C, D, E) with functional dependencies

$$F = \{A \to B, BC \to E, ED \to A\}$$

Check whether R is in 3NF? Also find that whether it is in BCNF?

4. Attempt any two parts of the following :   10×2=20

(a) What are the ACID properties of a transaction? How are these useful?

(b) Which of the following schedules are (conflict) serializable? For each serializable schedule, determine the equivalent serial schedule :

(i) r1 (x); r3 (x); w1 (x); r2 (x); w3 (x)

(ii) r1 (x); r3 (x); w3 (x); w1 (x); r2 (x)

(iii) r3 (x); r2 (x); w3 (x); r1 (x); w1 (x)

(iv) r3 (x); r2 (x); r1 (x); w3 (x); w1 (x)

(c) What is Serializability? Explain the view serializability in detail.

5. Attempt any two parts of the following : $10 \times 2 = 20$

(a) Define and explain the various types of transaction failures.

(b) Explain the two phase locking technique. How does two phase locking techniques guarantee serializability?

(c) What do you understand by Recovery? Explain the UNDO / REDO and the UNDO / NO-REDO(algorithms for recovery.

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