RAMAKRISHNA MISSION VIDYAMANDIRA

(Residential Autonomous College affiliated to University of Calcutta)

B.A./B.Sc. THRID SEMESTER EXAMINATION, MARCH 2022

SECOND YEAR [BATCH 2020-23]

Date : 07/03/2022 **COMPUTER SCIENCE (HONOURS)**

Time : 11 am – 1 pm **Paper : VII [CC7]** Full Marks : 50

Answer **any five** questions of the following: [5×10]

1. a) What are the issues of traditional file-based systems that make DBMS a superior alternative?

   b) What are the different levels of data abstraction? (5+5)

2. a) What is descriptive attribute? How it is differed from composite attribute?

   b) How do you choose a database model? What is the difference between ER model and Network model? (5+5)

3. a) What are different types of SQL statements? What are the differences between DROP, DELETE and TRUNCATE commands in SQL? What is the difference between WHERE and HAVING clause?

   b) Let R(ABCD) be a relational schema with the following functional dependencies:

   $F = \{A \rightarrow B, B \rightarrow C, C \rightarrow D, D \rightarrow B\}$. The decomposition of R into $D = \{AB, BC, BD\}$

   Check whether the decomposition is preserving dependency or not? [(2+1.5+1.5)+5]

4. a) What is the difference between trivial and non-trivial dependency? Write is pseudo transitivity? What is LR-minimum?

   b) Decompose the Following Relation R till BCNF

   R(ABDLPT) FD : $\{B \rightarrow PT, T \rightarrow L, A \rightarrow D\}$ Decompose the Relation R till BCNF. [(2+2+1)+5]

5. a) What is the difference between 3NF, 4NF and BCNF decomposition? What is partial key?

   b) Decompose the Following Relation R till 3NF

   R(ABCDEFGH) FD : $\{AB \rightarrow C, AC \rightarrow B, AD \rightarrow E, B \rightarrow D, BC \rightarrow A, E \rightarrow G\}$ [(3+2)+5]

6. a) What are database locks and its types? What is "lock escalation"? What is serializable schedule?

   b) What is lost update, dirty read, phantom row, incorrect summary problems in concurrent transaction?

   What do you mean by timestamp-ordering protocol? [(2+2+1)+(2+3)]

7. a) What is hashing and its advantages and disadvantages? What is B+ tree and its advantages and disadvantages?

   b) What is the difference between clustered and non-clustered indexes? What do you mean by Equivalence schedules? [(2+3)+(2.5+2.5)]

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