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

PAPER ID : 33215 Roll No.

B. Tech. Examination 2023-24

(Even Semester)

DATABASE MANAGEMENT SYSTEMS

Time : Three Hours] *[Maximum Marks : 60*

Note :– (i) Attempt all questions.

(ii) Be neat and precise in your answer.

SECTION–A

1. Attempt all parts of the following : 8×1=8

(a) What is data independency in DBMS?

(b) Write the difference between DDL and DML.

(c) What are advantages of normalization?

(d) Explain the different features of SQL.

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(e) What are ACID properties of transaction?

(f) What are various reasons for transaction failure?

(g) Name any five database systems?

(h) List the four functions of DBA.

SECTION – B

2. Attempt any two parts of the following : 2×6=12

(a) Differentiate the file processing system and database management system.

(b) What are the various types of users involved in DBMS operations? Explain each.

(c) Create an E-R diagram for university registrar office. The office maintains data about each class, each instructor teaching the class, number of students enrolled, number of students for each class and the time and date of class held. For each student-subject pair, a grade is also recorded. Take suitable assumptions if required.

(d) Define Boyce-Codd normal form. How does it differ from third normal form?

SECTION – C

Note :– Attempt all questions. Attempt any two parts from each questions. 8×5=40

3. (a) Consider the universal relation R = (A, B, C, D, E, F, G, H, I, J) and the set of functional dependencies F as given below :

$F = \{AB \rightarrow C, A \rightarrow DE, B \rightarrow F, F \rightarrow GH, D \rightarrow IJ\}$

(i) Determine the key for R

(ii) Decompose R into second normal form

(b) Explain the distinction among the terms, primary key, candiate key and super key.

(c) What is the role of data independence in DBMS?

4. (a) What is data abstraction? How the data abstraction is achieved in DBMS?

(b) What do you mean by time stamping protocol for concurrancy controlling? Explain.

(c) What are the different types of data models in DBMS? Explain in brief.

5. (a) Describe serializable schedule. Discuss conflict serializability with suitable example.

(b) Define transaction and explain its properties with suitable example.

(c) Draw overall structure of DBMS and explain its components in brief.

6. (a) Discuss 2 phase commit (2 PC) protocol and time stamp based protocol with suitable example.

(b) Compare generalizatino, specialization and aggregation with suitable example.

(c) Write the difference between 3NF and BCNF. Find normal form of relation R (A, B, C, D, E) having ED set :

$$F\{A \rightarrow B, BC \rightarrow E, ED \rightarrow A\}$$

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