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3 (Sem-4/CBCS) CSC HC 3

2023

**COMPUTER SCIENCE**

(Honours Core)

Paper : CSC-HC-4036

**( Database Management System )**

Full Marks : 60

Time : Three hours

**The figures in the margin indicate full marks for the questions.**

1. Write answer of the following questions as directed : 1×7=7

(a) The information stored in the catalog is called meta-data.

*(State True or False)*

(b) Physical data model describes the details of how data is stored on the computer storage media.

*(State True or False)*

Contd.

(c) Entity types that do not have key attributes of their own are called \_\_\_\_\_.  
(Fill in the blank)

(d) Key is a minimal superkey.  
(State True or False)

(e) 2NF is based on \_\_\_\_\_ dependency.  
(Fill in the blank)

(f) The \_\_\_\_\_ property requires that we execute a transaction to completion.  
(Fill in the blank)

(g) A primary index is specified on the ordering key field of an ordered file of records.  
(State True or False)

2. Define the following terms : 2×4=8

(a) Program-data independence

(b) DDL

(c) View

(d) Lossless decomposition

3. Answer **any three** of the following questions : 5×3=15

(a) Briefly explain main characteristics of database approach.

(b) Define the following terms :

(i) entity

(ii) attribute

(iii) composite attribute

(iv) multivalued attribute

(v) key attribute

Give *one* example for each.

(c) What is entity integrity and referential integrity constraints? Why is each considered important?

(d) Write an algorithm for ER-to-relational mapping.

(e) Discuss ACID properties of a database transaction.

4. Answer **any three** of the following questions : 10×3=30

(a) Explain ANSI/SPARC 3-level architecture.

- (b) Explain the operations of relational algebra.
- (c) Describe 1NF, 2NF, 3NF and BCNF with suitable example.
- (d) Differentiate between :
- (i) equi join and outer join
  - (ii) WHERE clause and HAVING clause of SQL
  - (iii) COMMIT and ROLLBACK
- (e) Discuss the steps required for database connectivity using JDBC.
- (f) Write short notes on : **(any two)**  
5×2=10
- (i) Concurrency control
  - (ii) Clustering index
  - (iii) Record blocking