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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 : $1 \times 7 = 7$
 - (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 : $2 \times 4 = 8$

(a) Program-data independence

(b) DDL

(c) View

(d) Lossless decomposition

3. Answer **any three** of the following questions : $5 \times 3 = 15$

(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 : $10 \times 3 = 30$

(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
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