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B.SC. IT (Semester: 4th)
DATABASE MANAGEMENT SYSTEMS I
Subject Code: BCSE0F95
Paper ID: [OE2130424]

Time: 03 Hours **Maximum Marks: 60**

Instruction for candidates:

1. Section A is compulsory. It consists of 10 parts of two marks each.
2. Section B consist of 5 questions of 5 marks each. The student has to attempt any 4 questions out of it.
3. Section C consist of 3 questions of 10 marks each. The student has to attempt any 2 questions.

Section – A **(2 marks each)**

Q1. Attempt the following:

a. Discuss Grant and Revoke commands with respect to Database protection.
b. Differentiate between relational calculus and relational algebra.
c. Discuss an Entity in context of Entity Relationship model.
d. What do you mean by a Functional Dependency?
e. Describe Serializability.
f. What is a primary index?
g. Define Primary Key with example
h. Discuss data independence.
i. What do you mean by an integrity constraint?
j. Describe locks in Database Management System (DBMS).

Section – B **(5 marks each)**

Q2. What do you mean by ACID properties of DBMS transactions? Discuss Two-phase Commit Protocol in detail.

Q3. What is a Data Model? Differentiate between Relational Model, Network Model, and Hierarchical Model.

Q4. Explain 3-schema architecture of DBMS with diagram along with mappings.

Q5. What do you mean by Access Control Mechanisms in a DBMS? Discuss Discretionary Access Control mechanism in detail.

Q6. Discuss the advantages and disadvantages of database management system over traditional file system.

Section – C **(10 marks each)**

Q7. What is Normalization? Discuss first four forms of normalization with example.

Q8. Write a short note on:

a) File Organization

b) Lost Update Problem

c) Relational Calculus

Q9. Consider the following database schema:

HOTEL (hotelNo, name, city)

ROOM (roomNo, hotelNo,type, price)

BOOKING(hotelNo,guestNo, roomNo, dateFrom, dateTo,)

GUEST(guestNo, name, city)

Give SQL statements for the following queries:

a) Create the table HOTEL.

b) Insert one row of data in BOOKING table taking suitable datatypes.

c) Update the name of Guest No. 1 to “Bhagwant Mann”.

d) List the bookings made between 31st August 2022 and 7th November 2022.

e) Give the names of all guests staying in hotel ‘HYATT’.