ISLAMIC UNIVERSITY OF TECHNOLOGY (IUT)

ORGANISATION OF ISLAMIC COOPERATION (OIC)

Department of Computer Science and Engineering (CSE)

MID SEMESTER EXAMINATION **SUMMER SEMESTER, 2021-2022**

DURATION: 1 HOUR 30 MINUTES **FULL MARKS: 75**

CSE 4461: Computer Science and Technology II

Programmable calculators are not allowed. Do not write anything on the question paper.

Answer **all 3 (three)** questions. Figures in the right margin indicate full marks of questions whereas corresponding CO and PO are written within parentheses.

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1. a) Define Database Management System (DBMS) along with its advantages. Briefly describe some applications of DBMS. 5 + 4 (CO1) (PO1)

   b) What are the different levels of abstraction in database management? Which type of analysis answer the question – "Why did something happen?", and how does it differ from answering the question – "What actions to take?" 3 + 6 (CO1) (PO1)

   c) Which characteristic of big data refers to the rate at which data grows? Explain the drawbacks of using file systems in data storage. 1 + 6 (CO1) (PO1)

2. a) Distinguish between data definition and data manipulation language. Draw a schema diagram of a library management system. 4 + 6 (CO3) (PO3)

   b) How can a self-join be used to compare data of the same table? Consider the following database schema: 5+10 (CO1) (PO1)

   salesman (salesman_id, name, city, commision)
   customer(customer_id, cust_name, city, grade, salesman_id)
   orders(ord_no, purch_amt, ord_date, customer_id, salesman_id)

   Based on the given schema, write SQL statements to answer the following queries:

   i. find the salesperson and customer who reside in the same city
   ii. find the distinct cities of the customers
   iii. find all salespersons along with customer name, city, grade, order number, date, and amount
   iv. find (customer's) city-wise total purchase amount, where the total purchase amount of a city must be more than $100.00
   v. find the top 5 customers with respect to the total number of orders placed

3. a) What is the role of a database administrator? Distinguish between structured, semi-structured, and unstructured data with examples. 2 + 6 (CO1) (PO1)

   b) How can a NOT NULL constraint raise an error? Explain with examples the different ways to define constraints in PostgreSQL. 2 + 6 (CO1) (PO1)

   c) How can you verify a 'gender' column of a table with a condition that the gender should be either 'male' or 'female' during value insertion? Explain the CASCADE referential action in foreign key constraint. Also, write an SQL statement to add a foreign key on 'salesman_id' column of an existing 'customer' table referencing to the primary key 'salesman_id' of a 'salesman' table 3 + 2 + 4 (CO2) (PO2)