



**Faculty of Computing and Technology**

**Department of Computer Science**

**Bachelor of Information Technology**

**Batch 04 – Semester 02**

**End Examination**

**Year 2023**

**BIT 1201 – Fundamentals of Database Management**

**Duration: 03 Hours**

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**Instructions to the candidates:**

- 1. Answer ALL the questions.**
- 2. Illustrate your answers with clear diagrams wherever applied.**
- 3. The paper is marked out of 100 Marks.**
- 4. Follow the General Guidelines given by the Department of Examination.**

**Question 01**

**Scenario: The Amaya Hills Hotel**

The Amaya Hills Hotel is a hilltop, snow-covered retreat located in the Rocky Mountains. The hotel requires an automated booking system to help manage its growing visitor numbers. The hotel needs to store the following data on all of their hotel rooms: room number, room purpose, room size, whether or not Wi-Fi is available, and price per night. The room purpose must be either bedroom, conference room or dining room. The room size must be either small, medium, or large. Each bedroom has the following extra data: bed type which can be either single or double. Each conference room has the following extra data: number of seats and whether or

not a projector is available. Each dining room has the following extra data: number of tables. Information is recorded about guests for promotions etc. Guest information includes their name, address, and contact number. A unique id is also assigned to each guest. When a guest

makes a booking, the start and end dates for the booking are recorded. Each booking is automatically assigned a unique booking number. A booking can refer to one and only one room, and one and only one customer.

- A. Draw an **Enhanced Entity Relationship (EER) diagram** to model the above fictional scenario. Your diagram should show entities, relationships along with the cardinalities and suitable attributes including the primary keys.

[15 marks]

- B. Consider the ER diagram drawn for question a) and map the **Hotel\_Room entity** to relational schema (consider primary key, foreign key, attribute types etc.).

[05 marks]

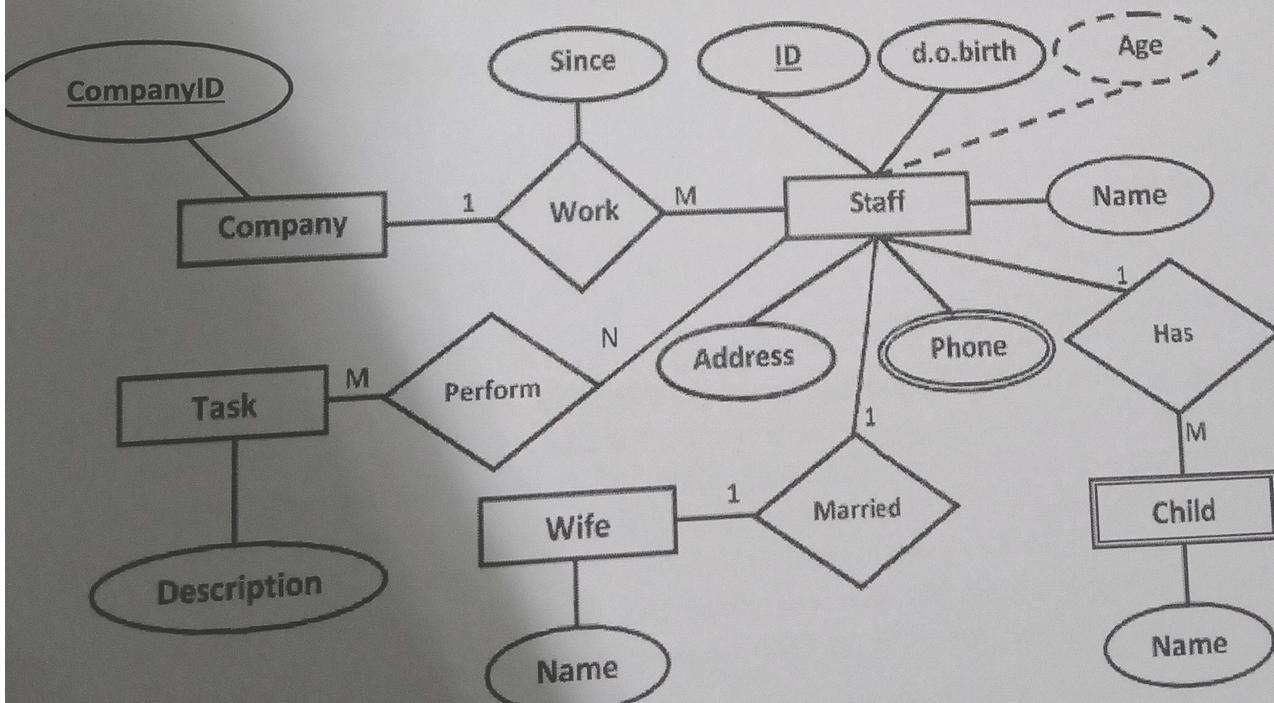
- C. What is the degree of the **Hotel\_Room table**?

[05 marks]

[Total = 25 marks]

## Question 02

- A. Map the ER diagram given below to a relation schema. Clearly mention if you are doing any assumptions when mapping the diagram.



[10 marks]

B. Briefly define the following relational terms.

- i. Tuple
- ii. Attribute
- iii. Domain
- iv. Relation
- v. Primary Key

[10 marks]

C. Explain what is meant by "Referential Integrity".

[05 marks]

[Total = 25 marks]

### Question 03

The table below shows the online food ordering information of "Yummy Eats Cafe".

Customer\_Orders Table

CustID	OrderID	Cust_Name	Contact_No	Food_Item	Total_Price	Date
C001	O005	Mekala	0771233212	Fried Rice	750.00	10/05/2023
C002	O045	Nihal	0753421256	Chicken Pizza	2140.00	22/05/2023
C003	O087	Sumanasekara	0781223432	Butter Naan	320.00	13/05/2023
C004	O032	Ajith	0773456721	Veg Roti	100.00	21/05/2023
C005	O090	Dhanu	0712349087	Fruit Salad	250.00	01/05/2023

Customer\_Orders table Primary Key: - (CustID, OrderID)

Answer the following questions using the table and dependencies given below on the Customer\_Orders table.

*Functional Dependencies:*

CustID → Cust\_Name, Contact\_No

OrderID → Food\_Item, Total\_Price

CustID, OrderID → Date

A. Which normal form is the relation in? Justify your answer.

[10 marks]

B. Decompose the relation into 2NF. For each step of the decomposition procedure, state what functional dependency it is based on, and give the relation schemas are the step has been carried out.

[15 marks]

[Total = 25 marks]

#### Question 04

Employee Table

EmployeeID	EmployeeName	HourlyRate	HoursWorked PerWeek	Department
231	Jones	34.00	35	BIOTECH
232	Mathews	22.00	37.5	HR
233	Kohli	55.00	30	HR
234	Kane	8.50	37.5	MECH
235	White	27.50	43	ENG
236	Black	28.00	40	BIOTECH

A. Write SQL queries for the following questions.

- i. Output the name of the employee, their employee ID and their weekly salary for each employee in the Biotech department.

[04 marks]

- ii. Find the employees who are not working at the HR Department.

[03 marks]

- iii. Write a SQL statement that demonstrates the effect of the GROUP BY clause.  
Use the Employee table to source an example.

[04 marks]

B. Describe THREE (3) benefits of using views in database applications. Use examples to illustrate your answer.

[06 marks]

C. Explain the following SQL keywords.

- i. SUM
- ii. ORDER BY
- iii. LIKE
- iv. COUNT

[08 marks]

[Total = 25 marks]

\*\*\*\*\* END OF THE PAPER \*\*\*\*\*