The Open University of Sri Lanka Faculty of Engineering Technology
Department of Electrical & Computer Engineering

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Study Programme	: Bachelor of Software Engineering Honours
Name of the Examination	: Final Examination
Course Code and Title	**: EEI3266 Information Systems and Data Management**
Academic Year	: 2021/2022
Date	: 17th June 2022
Time	: 10:00-13:00hrs
Duration	: **3 hours**

General Instructions

1. Read all instructions carefully before answering the questions.
2. This question paper contains four (04) questions. **ALL FOUR (4) questions are compulsory.**
3. Answer all questions.
4. Answers should be in clear handwriting.

Q1. (25 marks)

i. Define the term Business Process and describe a suitable example of a Business Process Management System. **(5 marks)**

ii. Define THREE (3) different ways of classifying DBMS and provide the types of DBMS under each classification. **(9 marks)**

iii. Describe THREE (3) different types of information systems available in real world with an example where it is used. **(6 marks)**

iv. Draw a diagram to represent the Three Level ANSI-SPARC database architecture. **(5 marks)**

Q2. (30 marks)

The following scenario is about the way a movie theatre operates.

The manager of a movie theater complex wishes to build a computer system to manage its operations. The theater complex has multiple cinema halls. Each hall may show different movie. Each hall has a name and a different number of seats. Halls are identified by a unique ID.
The theater complex maintains the date and time of screening of a movie in each hall. Each screening is called a session and is unique for the hall. A hall can have multiple sessions and a session cannot exist without a hall.
Details of the movies that the theatre shows needs to be recorded. This includes a movieID, movie name, duration and a description of the movie. Each movie belongs to one or more categories (e.g. romance, thriller, comedy, war, science fiction) and there can be many movies of the same category. Each Category is identified by a unique Category ID and has a Category name.
The theater sells a ticket for each seat in a hall for each session. A customer can buy many tickets Each ticket is identified by a unique Ticket ID and includes the cost of the ticket. The theater keeps a record of each customer that includes the name (stored as first name, middle name and last name), email address, at least two contact numbers and the age of customers calculated using their date of birth. For someone to be a customer he/she should have bought a ticket.

a) Identify the entities related to the above scenario and classify them as strong and weak entities. **(8 marks)**

b) Identify any primary key attributes, derived attributes, multivalued attributes and composite attributes. **(10 marks)**

c) Draw a suitable Entity Relationship diagram (ERD) for the above scenario. Indicate the cardinality and participation for each relationship. State any assumptions you make. **(12 marks)**

Q3. (20 marks)

This table is not well structured, un-normalized containing redundant data. Answer the questions given below based on the given table.

dentistNo	dentistName	patientNo	patientName	appointmentDate&Time	surgeryNo
1011	Malaka Perera	P100	T.A. Saman	12-Aug-22, 10.00	S10
1011	Malaka Perera	P105	T.D.B. Kasun	13-Aug-22, 12.00	S15
1024	Nimal Bandara	P108	D. Nimali	12-Sep-22, 10.00	S10
1024	Nimal Bandara	P108	D. Nimali	14-Sep-22, 10.00	S10
1032	Ashoka Silva	P105	T.D.B. Kasun	14-Oct-22, 16.30	S15
1032	Ashoka Silva	P110	C.M. Supun	15-Oct-22, 18.00	S13

i. Identify the reason as to why the given table is not in 1NF and what needs to be done in order to get the table into First Normal Form. **(2 marks)**

ii. What needs to be there for the table to be in Second Normal Form (2NF) and discuss whether the given table is in 2NF or not giving suitable examples. **(2 marks)**

iii. Identify if there are any transitive dependencies in the given table. **(6 marks)**

iv. Define the properties of a table in Third Normal Form and then decompose the given table so that it meets the 3NF properties. **(10 marks)**

Q4. (25 marks)

Answer the given questions based on the following tables SHOP and ACCESSORY.

SHOP

Shop_Id	Shop_Name	Area
S001	ABC Computers	CP
S002	All Infotech Media	GK II
S003	Tech Shoppe	CP
S004	Geeks Techno Soft	Ward Place
S005	Hitech Tech Store	Ward Place

ACCESSORY

AccNo	Name	Price	Shop Id
A01	Mother Board	12000	S001
A02	Hard Disk	5000	S001
A03	Keyboard	500	S002
A04	Mouse	300	S001
A05	Mother Board	13000	S002
A06	Keyboard	400	S003
A07	LCD	6000	S004
T08	LCD	5500	S005
T09	Mouse	350	S005
T10	Hard Disk	4500	S003

Write the SQL queries for the following referring the above tables.

i. Create the two tables including referential integrity constraints to link the two tables. **(9 marks)**

ii. Insert TWO (2) rows to each of the two tables created using the given values. **(4 marks)**

iii. To display Name and price of all the accessories in descending order of their price. **(2 marks)**

iv. To display Shop_Id and Shop_name of all Shops located in Ward place. **(2 marks)**

v. To display Maximum price pertaining to each of the each given names of accessories. **(2 marks)**

vi. To delete all the accessories with price less than 500/-. **(2 marks)**

vii. To modify the Area of 'ABC computers' to 'WP' **(2 marks)**

viii. To modify the 'Shop' table to include the 'Contact Number' of each shop. **(2 marks)**

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