

Instructions: Answer four (04) questions.

(This paper consists of 03 pages.)

1. (i) What are the advantages of using Database Management Systems (DBMS)?
(a) List 04 advantages of DBMS. (04 Marks)
- (ii) Briefly explain the following terms related to the databases:
(a) Data redundancy
(b) Referential integrity
(c) Tuple of a relation (09 Marks)
- (iii) Most of the users and programmers work with external schema of the three schema architecture. What type of SQL statements are important for the users in the external schema when interacting with databases? Giving suitable examples, explain the type of SQL statements that users and programmers need in external view. (12 Marks)
2. (i) List all the phases of Database Development Life Cycle. (DDLC) (06 Marks)
- (ii) Explain the following keys giving suitable examples:
(a) Candidate key
(b) Composite key
(c) Foreign key (09 Marks)
- (iii) The following relationship shows the outcome of the different stages of the database development process. Explain this relationship giving an example for designing and development process of a database.
Entity → Relation → Table (10 Marks)

3. (i) What is the data model? Briefly explain about the importance of data model in developing a database.

(07 Marks)

- (ii) A popular bank in Sri Lanka consists of many branches in island wide. Each branch has branch code, branch name and address. Every branch has many customers who have Customer ID, NIC, Name, address and phone No. Customers can have one or more accounts which have account No, Account type and balance. Each account has a number of transactions.

- (a) Draw the Entity Relationship Diagram considering the above description. (18 Marks)

4. (i) What is the purpose of normalization?

(05 Marks)

- (ii) Consider the following table which shows the relation called GRADE REPORT.

GRADE REPORT

Student_ID	Student_Name	University	Course_ID	Course_Title	Lecturer_Name	Department	Grade
168300	Samantha	Colombo	IS 350	Database Mgt	Kamal Perera	IT	A
168300	Samantha	Colombo	IS 465	System Analysis	Nimali Fernando	Software Eng.	B
543291	Rukshani	OUSL	IS 350	Database Mgt	Kamal Perera	IT	C
543291	Rukshani	OUSL	ACC 201	Fund Acctg	Codd Miller	Account	B
543291	Rukshani	OUSL	MKT300	Intro Mktg	Sumith De Silva	Marketing	A

- (a) In what normal form is this relation? (02 Marks)
- (b) Describe the functional dependencies in GRADE REPORT. (06 Marks)
- (c) Normalize GRADE REPORT relation into set of 2NF relations. (12 Marks)

Customer ID, Name, Branch name, Branch Address, Branch code



5. (i) What is SQL? Explain in brief.

(03 Marks)

(ii) Consider the following employee table and write SQL statements for the following:

Employee

EmpNo	Ful Name	Date_of_Birth	Gender	Department	Basic_Salary	Grade
E001	Saduni Perera	10/17/1983	Female	Account	35500	Grd2
E002	Nalaka Godahewa	07/27/1990	Male	Production	41400	Grd1
E003	Amila De Silva	11/02/1994	Male	Production	37800	Grd1
E004	Bandula Perera	08/20/1987	Male	Account	27450	Grd3
E005	Ruwani De Silva	09/25/1990	Female	Personnel	34600	Grd2

(a) Create the above "Employee" table with appropriate data types.

(05 Marks)

(b) Add a new record into Employee table with following details:

'EmpNo:006', 'Full Name: Sunannda De Silva', 'Date of Birth: 05/28/1996',

'Gender: Male', 'Department: Marketing', 'Basic_Salary: 38900' and

'Grade: Grd1'.

(06 Marks)

(c) List all Male employees who are working in Account or personnel departments.

(05 Marks)

(d) Management decided to give 10% salary increment for Gradel employees whose salary is greater than 35000. Write SQL statement to update relevant changes in the employee table.

(06 Marks)