

Department of Technical Education and Training

NVQ Level 05 Written Examination – December 2020 (March/April 2021) (Semester I)

National Diploma in Information & Communication Technology

Database Systems I

5S1NVQ001

Three Hours

Instructions: Answer any four (04) questions.

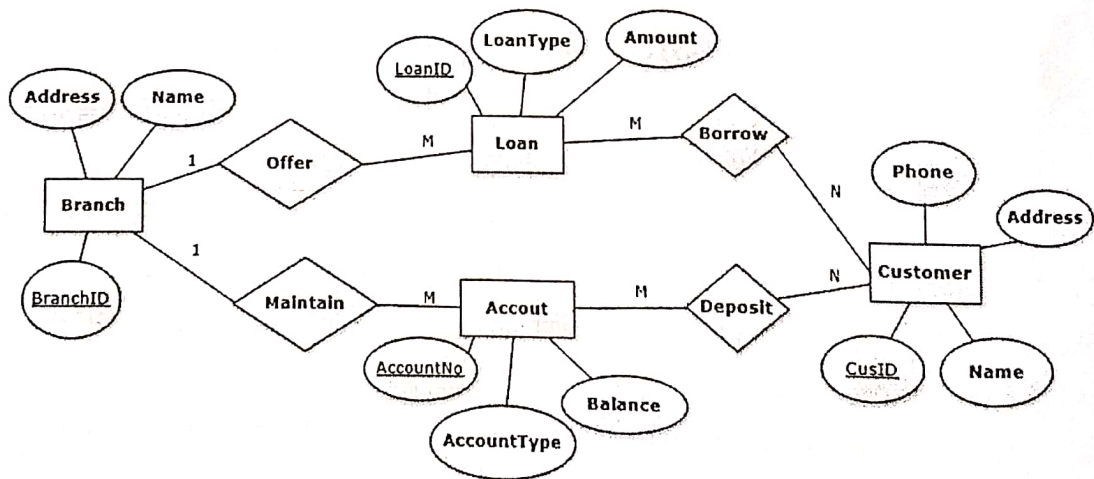
(This paper consists of 03 pages.)

1. (i) What is a Database Management System (DBMS)? Define it. (05 Marks)
- (ii) Clarify the difference between "Database" and "Database Management System (DBMS)". (05 Marks)
- (iii) A DBMS is a combination of five components. List them down. (05 Marks)
- (iv) Briefly explain the three schema architecture of a database. (10 Marks)
2. (i) What do you mean by "Constraints" in database design? (05 Marks)
- (ii) State 3 kinds of Constraints in the ER Model. (05 Marks)
- (iii) Suppose you are given the following requirements for a simple database for the Provincial Premier League (PPL) of cricket:
- The PPL has many teams.
 - Each team has an ID, a name, a city, a captain, and a Coordinator
 - Each team is trained by few coaches but a coach is engaged to work with one team
 - Each player belongs to only one team,
 - Each player is sponsored by a company but a company can sponsor for many players
 - Each player has a name, a position (such as Batsman or Bowler) and a skill level
 - A match is played between two teams and has a date (such as 2017/05/11) and a score (350/6 and 351/9).
- Construct a clean and concise ER diagram for the PPL database and list your assumptions and clearly indicate the cardinality mappings. (15 Marks)

3. (i) Explain the concept of Function Dependency using a suitable example. (05 Marks)
- (ii) Consider the following relation that keeps details of employees and their duties.

empID	empName	empskills	deptID	deptname	deptgrade	proId	proname	produration
e001	Mahesh	Network,	DN01	Network	Grade B	p001	B-web	6 Months
e001	Mahesh	PHP	DN01	"	"	p001	"	"
e001	Mahesh	Network,	DN01	Network	Grade B	p003	B-shop	12 Months
e001		PHP	"	"	"	"	"	"
e005	Amalee	Java,	DS02	Software	Grade A	p005	Bookshop	6 Months
e005		DBMS,						
e005		PHP						
e005	Amalee	Java,	DS02	Software	Grade A	p001	B-web	6 Months
e005		DBMS,						
e005		PHP						

- (a) At which normal form that the above relation remains? Clarify your answer. (05 Marks)
- (b) Normalize above relation into all possible normal forms. (15 Marks)
4. (i) State 3 kinds of Constraints in the Relational Model. (05 Marks)
- (ii) Consider a sample ER diagram for a bank given below.



Map (Convert) above ER diagram into relational model. Make sure to indicate all relevant keys clearly. (20 Marks)

5. Consider the relational schema given below.

Employee (EmpID, Empname, City, TPno, Age, Datejoined)

Department (DeptID, Dname, No_of_Sections, Grade)

Write SQL statements for the following:

- (i) Create two tables of Customer and Product given above.
(Choose suitable data types for each field.)
- (ii) Modify the Employee table by Adding a foreign key called D_ID which is referred to the DeptID field in the Department table.
- (iii) Add a record to the Employee table as given below.
EmpID = E001
Empname = Sandya
City = Colombo
TPno = 0777562184
Age = 28
Datejoined = 2010/02/15
D_ID = ACC
- (iv) Display all the names, Telephone Numbers of employees who are working in the Account department.
- (v) Delete all the employees who joined before 1998/01/01.
(Assume that many records are available in both Employee and Department table for (iv) and (v) parts of the question)

(05×05=25 Marks)

- ❀ ❀ ❀ -