CES/16/17/00446

**OLABISI ONABANJO UNIVERSITY**
**COLLEGE OF ENGINEERING AND ENVIRONMENTAL STUDIES, IBOGUN**
**FACULTY OF ENGINEERING**
**DEPARTMENT OF COMPUTER ENGINEERING**
**2020/2021 HARMATTAN SEMESTER EXAMINATION**

**COURSE CODE:** CPE 513 **COURSE TITLE:** DATABASE MANAGEMENT SYSTEMS
**TIME ALLOWED:** 2 Hours
**COURSE UNIT:** 2
**INSTRUCTION:** Answer Any **THREE** (3) Questions

**Question One**

(a) Define the following terms:
(A) Database (B) Database Management System — *4 mrks*
(b) In one sentence, describe the relationship between Information and Data — *2 mrks*
(c) Mention four classes of Databases — *2 mrks*
(d) What is the fundamental objective of a Database Management System (DBMS)? — *2 mrks*
(e) List eight (8) functions of a Database — *4 mrks*
(f) List three (3) types of Data Structure — *3 mrks*
(g) Mention three (3) yardsticks used in determining the nature of data to deal with in Databases — *3 mrks*

debugging

**Question Two**

(a) What is an Entity Relationship Diagram (ERD)? List three (3) typical use cases of an ERD? — *4 mrks*
(b) What is the highest level of abstraction in data modelling is called? — *1 mrk*
(c) What do you understand by Data Modelling? — *2 mrks*
(d) What is an Entity? Give 4 classes that the types of Entity can be grouped into — *5 mrks*
(e) What are Relationships in relation to Data Modelling? List three types of Relationships — *4 mrks*
(f) What are Attributes? Distinguish between Primary Key and Foreign Key — *4 mrks*

**Question Three**

(a) What do you understand by Database Model? — *2 mrks*
(b) List four (4) types of Database Models — *4 mrks*
(c) Using diagrams only, describe two of the models mentioned in (b) — *4 mrks*
(d) What is a Relational Database Management System? — *2 mrks*
(e) List four (4) examples of a Relational Database — *2 mrks*
(f) Distinguish between Object-oriented and Relational Database models — *2 mrks*
(g) Define the following terms in relation to a Relational Databases:
(A) Tuple (B) Cardinality (C) Degree (D) Domain — *4 mrks*

**Question Four**

(a) What is a Query Language? — *2 mrks*
(b) List and distinguish between two categories of Query Languages — *4 mrks*
(c) What is a Relational Algebra? — *2 mrks*
(d) List and define three (3) Unary and three (3) Binary Relational Algebraic operators — *6 mrks*
(e) Given two tables for STUDENT (**S**) and DEPARTMENT (**D**), as shown in Table Q.4e, evaluate the Cartesian Product **S** x **D** and obtain another Relation titled STUDENT_DEPARTMENT — *4 mrks*

| **STUDENT (S)** | |
|---|---|
| **STUDENT ID** | **STUDENT NAME** |
| 100 | Omobola |
| 110 | Omotola |
| 120 | Omoshebi |
| 130 | Omolara |
| 140 | Omoyeni |

| **DEPARTMENT (D)** | |
|---|---|
| **DEPT ID** | **DEPT NAME** |
| 10 | Computer Engr'g |
| 20 | Electrical Engr'g |
| 30 | Civil Engr'g |
| 40 | Architecture |

**Table Q. 4e**

(f) For the STUDENT Relation in Table Q.4e, what is the meaning of this operation: $\rho_U(S)$

where U = Undergraduate and S = Student. Perform this operation on the Table S — *2 mrks*

**Question Five**

(a) What is a Structure Query Language (SQL)? — *1 mrk*

(b) Give the full meaning of the following abbreviations, with regards to SQL commands:
(i) DDL (ii) DML (iii) TCL (iv) DQL — *4 mrks*

(c) In a table, list and describe four (4) DDL commands — *4 mrks*

(d) Write out a syntax for creating a Table with three (3) columns — *2 mrks*

(e) Distinguish between Security and Integrity in Database systems — *2 mrks*

(f) Mention four (4) techniques of ensuring data security in database management — *2 mrks*

(g) List four (4) most common Data security threats in Databases — *4 mrks*

(h) What do you understand by Data Availability? — *1 mrk*