FreeExams.co.ke

UNIVERSITY EXAMINATIONS
2022/2023 ACADEMIC YEAR

SPECIAL/SUPPLEMENTARY EXAMINATIONS
YEAR TWO SEMESTER TWO EXAMINATIONS

FOR THE degree in
Computer Science

COURSE CODE : **CSC 221/310**

COURSE TITLE : **DATABASE SYSTEM 1**

DATE: 11/08/2023   TIME: 11AM-1PM

INSTRUCTIONS TO CANDIDATES

ANSWER QUESTIONS ONE AND ANY OTHER TWO.

Question One

a) Define the data abstraction as used in database management systems.   [2 Marks]

b) Briefly explain the four tends in database technology   [4 Marks]

c) Study the following narrative and use it to answer the question that follows:

A student must be enrolled on only one course and a course must have students enrolled on it. Each course is identified by a deptID, CourseID, and courseName. Each course must have a number of modules and a module must be part of atleast one course. A module is identified by ModuleID. ModuleName must have a lecturer as a subject leader but a lecturer may not necessarily be a subject leader or may lead more than one module

Draw the entity relationship diagram showing cardinalities and optionality   [8 Marks]

d) The aid of an example in each case, distinguish between physical and logical data independence as used in database design.   [4 Marks]

e) Describe any six components of a database management system outlining their specific roles.   [6 Marks]

f) Mwaziri intends to design an Entity relationship diagram for a proposed database system outline six procedures guidelines that with enable him meet his objectives.   [6 marks]

Question Two

a) Briefly explain the six objectives of the three level architecture in implementing database systems   [8 Marks]

b) Explain two functions of a system analyst during database development   [2 Marks]

c) Describe each of the following criteria for classification of database management systems
   i.   Based on data models   [2 Marks]
   ii. Based on the number of users   [2 Marks]
   iii. Based on database distribution   [2 Marks]

d) State two differences between the file based approach and the database approach [4 Marks]

Question Three

a) Explain the role of an entity relation diagram in database design.   [2 Marks]

b) Distinguish between a schema and an instance as used in database system   [3 Marks]

c) With the aid of an example in each case, describe each of the following attributes as used in databases
   i.   MultiValued   [2 Marks]
   ii. Composite   [2 Marks]
   iii. Derived   [2 Marks]

d) With the aid of a diagram, describe the three schema database architectures   [9 marks]

Question Four

a) A programmer opted to create an application that used file system as a means of storing data. Explain **six** challenges that the system is likely to experience from using this approach

[6 Marks]

b) Describe a relational database management system [2 marks]

c) List six examples database management systems available in the market [3 marks]

d) Explain the following terms [5 Marks]
   i.   Database
   ii. Field
   iii. Record
   iv. Instance
   v.   Schema

e) Explain two circumstances that would make an organization to implement a client server database architecture [4 Marks]

Question Five

a) Define the following terms: [5 Marks]
   i.   Databases
   ii. Database Management
   iii. Data Model

b) Briefly explain any five applications of database systems. [5 Marks]

c) Using a diagram, explain the 3-tier database architecture outlining its benefits [5 Marks]

d) Discuss briefly with the aid of diagrams the shapes used to represent the various objects in an entity relationship diagram. [5 Marks]