KIBABII UNIVERSITY

UNIVERSITY EXAMINATIONS
2021/2022 ACADEMIC YEAR

END OF SEMESTER EXAMINATIONS
YEAR TWO SEMESTER TWO EXAMINATIONS

FOR THE DEGREE IN
COMPUTER SCIENCE

COURSE CODE : CSC 221

COURSE TITLE : DATABASE SYSTEM 1

DATE: 11/5/2022 **TIME:** 02.00 P.M – 04.00 P.M

INSTRUCTIONS TO CANDIDATES

ANSWER **QUESTIONS ONE AND ANY OTHER TWO.**

QUESTION ONE (COMPULSORY) [30 MARKS]

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

b) Briefly explain the four trends 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) With 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 [20 MARKS]

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 [20 MARKS]

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 [20 MARKS]

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 [20 MARKS]

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]