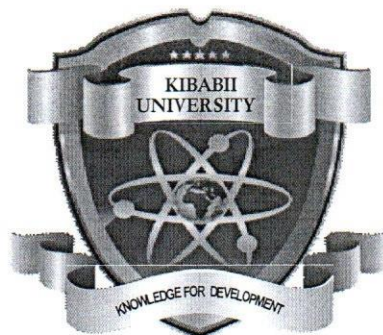(Knowledge for Development)

KIBABII UNIVERSITY

UNIVERSITY EXAMINATIONS
2017/2018 ACADEMIC YEAR

SPECIAL/SUPPLEMENTARY EXAMINATIONS

FOR THE DEGREE OF
SCIENCE MATHEMATICS & PHYSICS

COURSE CODE : CSC 212

COURSE TITLE : DATABASE SYSTEMS

DATE: 02/10/18   **TIME:** 3.00AM – 5.00PM

INSTRUCTIONS TO CANDIDATES

ANSWER QUESTIONS ONE AND ANY OTHER TWO.

INSTRUCTIONS

- Answer **QUESTION ONE** and attempt **ANY OTHER TWO** questions

QUESTION ONE (30 MARKS)

a) Define the following terms: [6 Marks]
   i.   Database
   ii. Database system
   iii. Database management system

b) How would you describe a condition in which one attribute is dependent on another attribute and neither attribute is part of the primary key? Reduction to which normal form is designed to eliminate such dependencies? [5 Marks]

c) State THREE advantages of centralized databases [6 Marks]

d) Describe what you understand by the term 'Relational Model' and identify the main components of relational Model [5 Marks]

e) With examples discuss **three** characteristics of attributes [6 Marks]

Section B: (Q2-Q5 Attempt any 2 questions 20 marks each)
QUESTION TWO (20 MARKS)

a) You are asked to design a database system for a health club. The database would contain data about customers, their training, contact numbers, etc. Show the main steps you would perform for designing and implementing the database. (Don't show the actual schemas!) [6 Marks]

b) You are to advice your former school to develop a database for keeping students and staff records; outline and discuss how the school stands out to benefit from the database; [5 Marks]

c) Describe the ANSI/SPARC three level architecture for database management systems software and explain the advantages it provides. [9 Marks]

QUESTION THREE (20 MARKS)

a) Discuss any three types of databases [3 Marks]

b) To develop a database management system, there are several components that must be incorporated discuss the following; [6 marks]
   i.   Data manipulation Language
   ii. Data definition language
   iii. Query language

c) For the database system to run it must run in an environment, discuss in your own view the components that make up the database system environment [11 Marks]

QUESTION FOUR (20 MARKS)

a) What do you understand by data dictionary? [2 marks]

b) Outline the information stored in the system catalog [10 marks]

c) Outline the disadvantages of file-based approach to databases (8 marks)

Question Five (20 Marks)

a) TransIT policy is to ensure up-to-date information on the processing and current location of each shipped item. To execute this, TransIT relies on a company-wide database. Shipped items are the heart of the TransIT product tracking system. Shipped items can be characterized by item number (unique), weight, dimensions, insurance amount, destination, and final delivery date. Shipped items are received into the TransIT system at a single retail center. Retail centers are characterized by their type, uniqueID, and address. Shipped items make their way to their destination via one or more standard TransIT transportation events (i.e., flights, truck deliveries). These transportation events are characterized by a unique scheduleNumber, a type (e.g, flight, truck), and a deliveryRoute.

    i)   Identify the entities that constitute this database the attributes in each   [4 Marks]

    ii)   Draw an Entity Relationship diagram that captures this information about the TransIT system.   [5 Marks]

b) Constructing a database table encompasses some unique features. Describe five distinct properties of a table structure   [5 Marks]

c) Integrity constraints are used to ensure accuracy and consistency of data in a relational database. Explain the three types of integrity constraints that assist in ensuring the two properties (accuracy and consistency) of data   [6 Marks]