



# Kirinyaga University College

(A Constituent College of JKUAT)

## UNIVERSITY EXAMINATION 2015/2016

### YEAR III SEMESTER I EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN (INFORMATION TECHNOLOGY)

#### ICS 2404: ADVANCED DATABASE SYSTEMS

**Date:** Wednesday, 9<sup>th</sup> December 2015

**Time:** 8.30am – 11.00pm

#### INSTRUCTIONS:

*Answer question **One** and any other **Two** questions*

#### **QUESTION ONE (30 MARKS)**

- a) In relation to database systems, explain the following terms: (8 marks)
- (i) Transaction processing
  - (ii) Business Intelligence
  - (iii) Distributed database
  - (iv) Big data
- b) Distinguish the following concepts as used in databases. (6 marks)
- (i) Data mining and data ware housing
  - (ii) Heterogeneous and homogeneous systems
  - (iii) Database and database management system (DBMS)
- c) Describe **three** phases the DBMS uses to process queries. (6 marks)
- d) Outline **three** advantages and **three** disadvantages of DBMS. (6 marks)
- e) Discuss the **two** phase locking protocol. (4 marks)

#### **QUESTION TWO (20 MARKS)**

- a) There are **four** critical properties of a transaction commonly referred to as the ACID properties. Describe these properties. (8 marks)
- b) Compare and contrast OLTP and OLAP under any four categories. (8 marks)
- c) Describe the function or the following in relation to transaction processing. (4 marks)
- (i) Scheduler
  - (ii) Recovery manager

### QUESTION THREE (20 MARKS)

- a) What do you understand by the term Database performance turning? (2 marks)
- b) Explain the role of Indexes in Database performance turning (2 marks)
- c) Describe the **four** characteristic of a data warehouse. (8 marks)
- d) Outline any **four** application areas of data mining. (8 marks)

### QUESTION FOUR (20 MARKS)

- a) Distinguish between thin client and a fat client as used in client server database systems. (4 marks)
- b) XML documents can be grouped into three main categories, describe these categories. (6 marks)
- c) Distinguish between object database and relational database. (4 marks)
- d) Differentiate between structure, semi-structured and unstructured data. (6 marks)

### QUESTION FIVE (20 MARKS)

- a) List any **four** sources of Big Data. (2 marks)
- b) Outline the **four** dimensions of Big Data (8 marks)
- c) Describe the basic four Business Intelligence (BI) Architecture components. (8 marks)
- d) Describe the term Social mining. (2 marks)