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**GARISSA UNIVERSITY**

**UNIVERSITY EXAMINATION 2019/2020 ACADEMIC YEAR FOUR**

**SECOND SEMESTER EXAMINATION**

**SCHOOL OF INFORMATION SCIENCE AND TECHNOLOGY**

**FOR THE DEGREE OF BACHELOR OF INFORMATION SCIENCE**

**COURSE CODE: COM 413**

**COURSE TITLE: OBJECT ORIENTED PROGRAMMING**

**EXAMINATION DURATION: 2 HOURS**

**DATE: 14/02/2020 TIME: 2.00-4.00 PM**

**INSTRUCTION TO CANDIDATES**

* **The examination has FIVE (5) questions**
* **Question ONE (1) is COMPULSORY**
* **Choose any other TWO (2) questions from the remaining FOUR (4) questions**
* **Use sketch diagrams to illustrate your answer whenever necessary**
* **Do not carry mobile phones or any other written materials in examination room**
* **Do not write on this paper**

**This paper consists of TWO (2) printed pages *please turn over***

**QUESTION ONE (COMPULSORY)**

1. Discuss in detail the following concepts in OOP: **[9 marks]**
   1. Data abstraction
   2. Encapsulation
   3. Overloading
2. Discuss in detail **SIX** fundamental data types in Java **[6 marks]**
3. Write a program that implements the concept of reusing classes by inheritance **[5 marks]**
4. With the aid of an example explain a java applet **[5 marks]**
5. List five inbuilt methods associated with applets **[5 marks]**

**QUESTION 2**

1. Using a simple program illustrate the use of constructors **[10 marks]**
2. Differentiate between passing objects by value and by reference. **[5 marks]**
3. Distinguish between function overloading and function overriding **[5 marks]**

**QUESTION 3**

1. What is exception handling? **[5 marks]**
2. Write a Java method that will find a factorial of a number n. **[5 marks]**
3. Use your method in b) above in a java program that generates and displays the factorial of a number that is entered at the keyboard **[10 marks]**

**QUESTION 4**

1. What is an array? **[2 marks]**
2. Give the syntax and an example of an array. **[3 marks]**
3. Write a program in Java that will display a 12x 12 multiplication table. **[15 marks]**

**QUESTION 5**

1. Write a brief note on the following:
2. Interfaces
3. Inner classes **[4 marks]**
4. What are three different access specifies used to hide the implementation in JAVA? Explain them in detail. **[6 marks]**
5. What do we mean by operator overloading? Give an example. **[5 marks]**
6. Write a brief note on the different types of inheritance in JAVA **[5 marks]**