



TECHNICAL UNIVERSITY OF MOMBASA

INSTITUTE OF COMPUTING AND INFORMATICS

DEPARTMENT OF COMPUTER SCIENCE & INFORMATION

TECHNOLOGY

UNIVERSITY EXAMINATION FOR:

BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY

BIT2203: ADVANCED PROGRAMMING

SPECIAL/SUPPLEMENTARY EXAMINATION

SERIES: SEPTEMBER 2018

TIME: 2 HOURS

DATE: Sep 2018

Instructions to Candidates

You should have the following for this examination

-Answer Booklet, examination pass and student ID

This paper consists of **FIVE** questions. Attempt question ONE (Compulsory) and any other TWO questions.

Do not write on the question paper.

Question One

- a) Describe three design strategies for object oriented programming [10marks]
- b) Using an example distinguish between the following programming terms
 - i. Main class [2 marks]
 - ii. Generic class [2marks]
 - iii. Interface class [2 marks]
 - iv. Abstract class [2 marks]
- b. Briefly explain the following terms as used in programming:
 - i. getters
 - ii. destructor[4 marks]
- c. Explain two advantages of design patterns [4 marks]
- d. Distinguish the following as used in generic programming

- i. Parameterized type
- ii. Data type

[4 marks]

Question Two

Using a suitable example explain the design pattern 'Factory' and how it is implemented in java

[20 marks]

Question Three

Write a generic class called pair with the following characteristics:

- i. Two private data members of the same type
- ii. Constructor that takes in two values and initializes the two data members
- iii. Getter methods that returns value of each of the data members

[20 marks]

Question Four

Suppose we wish to model a modular application for calculating area of any three geometrical shapes i.e. circle, square, and rectangle.

- i. Identify members of each shape class
- ii. Select a modularity criteria suitable for this problem
- iii. Write a java implementation for all of the above classes

[7marks]

[2marks]

[11 marks]

Question Five

Write a program in java that takes in any two numbers from the user and operates the numbers appropriately based on the operation entered by the user. The program should understand four types of operations (addition, subtraction, division, multiplication). Required: identify and use a suitable design pattern.

[20 marks]