



TECHNICAL UNIVERISTRY OF MOMBASA

Faculty of Engineering & Technology

DEPARTMENT OF COMPUTER SCIENCE & INFORMATION TECHNOLOGY

UNIVERSITY EXAMINATION FOR DEGREE IN:
BACHELOR OF MECHANICAL ENGINEERING
(BSME – Y2 S2)

ICS 2276: COMPUTER PROGRAMMING

END OF SEMESTER EXAMINATION
SERIES: DECEMBER 2014
TIME: 2 HOURS

Instructions to Candidates:

You should have the following for this examination

- *Answer Booklet*

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

Maximum marks for each part of a question are as shown

This paper consists of **TWO** printed pages

Question One (Compulsory)

Suppose that a file named “test data.txt” contains the following information. The first line of the file is name of a student. Each of the next three lines contain an integer. The integers are the students’ scores on the three exams. Write a program that will read the information in the field and display (on standard output) a message that contains the name of the student and the student’s average grade on the three

exams. The average is obtained by adding up the individual exam grade and then dividing by number of exams. **(30 marks)**

Question Two

- a) List FOUR fundamentals data types in C++ programming **(4 marks)**
- b) Outline FOUR benefits of object oriented programming **(6 marks)**
- c) Write a C++ program which uses a class called rectangle to calculate area of a rectangle **(10 marks)**

Question Three

The quadratic formula can be used to get the roots of any quadratic equation as follows:

$$\frac{x = -b \pm \sqrt{b^2 + 4ac}}{2a}$$

Write a C++ program that can be used to implement this program **(20 marks)**

Question Four

Write a C++ program that prompts the user for students marks and displays grade A if marks is ≥ 70 , B if marks greater than 60 but less than 70, C if marks greater than 50 but less than 60, D if marks greater than 40 but less than 50, and fail if marks less than 40 **(20 marks)**

Question Five

- a) Explain using code how you would apply the conditional ternary operator **(5 marks)**
- b) Write a C++ program that can calculate the cube root of a number **(5 marks)**
- c) Write a C++ program that calculates the factorial of a number **(10 marks)**