



TECHNICAL UNIVERISTRY OF MOMBASA

# Faculty of Engineering & Technology

DEPARTMENT OF COMPUTER SCIENCE & INFORMATION TECHNOLOGY

UNIVERSITY EXAMINATION FOR DEGREE IN:  
BACHELOR OF CIVIL ENGINEERING  
(BSC – Y2 S2)

ICS 2276: COMPUTER PROGRAMMING

SPECIAL/SUPPLEMENTARY EXAMINATION

SERIES: FEBRUARY 2015

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

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**Question One (Compulsory)**

a) How many times does this code print? (2 marks)

```
DO = I = 1, 4  
DO j = i, 3  
    print *, '*'  
END DO  
END DO
```

b) Write a function that will take a number and return a number that is the original number taken to a given exponent. (4 marks)

c) What are the FIVE LOGICAL operations in FORTRAN? (8 marks)

d) What are the SIX descriptors of a Fortran Format statement? (6 marks)

e) What is an integrated development environment (2 marks)

f) Distinguish between the following:

(i) Syntax and semantics

**(ii) Function and subroutine**

**(4 marks)**

g) Define the following:

- (i) Variable
- (ii) Iteration

**(4 marks)**

h) What data types should one use to represent:

- (i) Number of children at a school
- (ii) A letter grade on an exam
- (iii) Average number of school days present each year

**(3**

**marks)**

**Question Two**

The visible spectrum includes wavelengths that range from 380nm to 750nm. A breakdown of these wavelength into color is

Violet: 380-450nm blue: 450 – 495nm green: 495 – 570nm

Yellow: 570 – 590nm orange: 590 – 620nm red: 620 – 750nm

Suppose we have a variable wavelength already initialized to hold some wavelength in nm and a string variable color that is initialized.

- a) Write a block of code that initializes color correctly based on the value of wavelength.
- b) Give a set of test values for wavelength that you would use to full branch coverage testing of your solution.

**Question Three**

Write a program using a loop which gives a Celsius to Fahrenheit conversion table in unit steps from 0°C to 100°C. Use  $C * 9/5 + 32$  **(20 marks)**

**Question Four**

- a) Write a program which writes out the square root of every whole number form 1 to 10
- b) Devise a program that takes in 3 numbers from the keyboard, a, b and c. Calculate the equation below and prints the result:

$$\sqrt{b^2 - 4ac}$$

NB: Computer will never square root a negative number

**Question Five**

Write a program that will store 50 numbers, names, social security numbers into an array and sort the array and print out the data. You do not have to code the sort subroutine, but this is the function call for the sort subroutine. Bubble (num, name, SSN)