



MACHAKOS UNIVERSITY

University Examinations for 2016/2017

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

**FIRST YEAR SECOND SEMESTER EXAMINATION FOR DEGREE IN
BACHELOR OF SCIENCE CIVIL ENGINEERING**

ECU 102: COMPUTER PROGRAMMING I

DATE: 16/6/2017

TIME: 8:30 – 10:30 AM

INSTRUCTIONS

Answer Questions ONE and Any Other Two Questions

QUESTION ONE (COMPULSORY) (30 MARKS)

- a) Define the following terms giving examples where applicable: (4 marks)
 - i) Algorithm
 - ii) Debugging
 - iii) Syntax
 - iv) Function
- b) Explain any two tools needed to develop a program in C. (4 marks)
- c) Briefly describe the evolution of programming languages. (6 marks)
- d) Write an algorithm that reads two values, determines the largest value and prints the largest value with an identifying message. (3 marks)
- e) Draw the flow chart of the algorithm in Q1 d) above. (3 marks)

- f) Give the meaning of the following, with examples. (3 marks)
- i) Preprocessor command
 - ii) Keyword
 - iii) Comment
- g) Write a program that declares one integer variable called **num**, assigns it the value of 1000 and then, displays the value on the screen as shown below:
1000 is the value of num (3 marks)
- h) Define operator precedence (1 mark)
Give the relative precedence of arithmetic operators (1 mark)
- i) With the aid of a diagram distinguish between Repeat...Until and While...Loop (2 marks)

QUESTION TWO (20 MARKS)

- a) Describe briefly five components of a C program. (10 marks)
- b) Define the following giving an example of how each can be expressed in a C program:
- i Function prototype
 - ii Function header
 - iii Function call (6 marks)
- c) Write a C program that captures and stores the values 'X' and 76.1 in separate memory cells. Your program should get the values as data items and display them again for the user when done. (4 marks)

QUESTION THREE (20 MARKS)

- a) Write a program that computes the area of a rectangle, given its dimensions. It first prompts the user for the length and width of the rectangle and then displays the area. (5 marks)
- b) Explain using examples the two ways an array can be declared in C programming language. (4 marks)
- c) Explain three types of errors a programmer encounters during debugging (6 marks)
- d) List and explain any **five** types of constants used in C programming. (5 marks)

QUESTION FOUR (20 MARKS)

- a) Describe how a structure variable is defined and how one can access members of a structure. (2 marks)
- b) Distinguish between the following
- i A variable and a constant (2 marks)
 - ii A local variable and a global variable (2 marks)
 - iii Top down design and bottom up design (2 marks)
 - iv Variable declaration and Variable initialization (2 marks)
- c) A program is required to calculate the sum of all odd integers and the product of all even integers between 1 and 55 inclusive. The program should then output both the sum and product using a suitable output format.
- As part of your solution to the above problem, write
- i) An algorithm solution (5 marks)
 - ii) A C program implementation of the algorithm. (5 marks)

QUESTION FIVE (20 MARKS)

- a) Explain the stages of program development in programming. (7 marks)
- b) Write a program that produces the menu below and allows users to select a figure and enter the relevant parameter. The program should calculate and display area correct to 2 decimal places. (10 marks)
- Volume of polygons
- i Cylinder
 - ii Cone
 - iii Cuboid
 - iv Sphere
 - v Exit
- c) Describe three control structures that control program execution. (3 marks)