



MACHAKOS UNIVERSITY COLLEGE

(A Constituent College of Kenyatta University)
University Examinations for 2015/2016 Academic Year

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

FIRST SEMESTER EXAMINATION FOR DEGREE OF BACHELOR OF SCIENCE IN ELECTRICAL AND ELECTRONICS ENGINEERING

EEE200: COMPUTER PROGRAMMING 2

Date: 1/8/2016

Time: 2.00-4.00 PM

INSTRUCTIONS

Instruction: answer question one and any other two

Question One (30 marks)

- Differentiate between a variable and a constant. With example, demonstrate how we declare constants and variables in C++ language **(4 marks)**
- Explain the major characteristics of object oriented programming **(4 marks)**
- Write a C++ program which accepts the marks of 5 students then pass this marks to a function which calculates and returns the grade of the student. The grading criteria is as follows **(8 marks)**

Student marks	Grade
≥ 70 and ≤ 100	First class honours
≥ 60 and ≤ 69	Second class honours
≥ 50 and ≤ 59	Second lower class
≥ 40 and ≤ 59	pass
≥ 0 and ≤ 39	Fail

The program should then display the output using the following format, make use of a class

#	Marks	Grade
1	85	First class honours
2	56	Second lower honours
3	40	Pass
4	20	Fail
5	71	Second class honours

- d. Draw a flowchart for program which accepts n numbers from the keyboard and find their sum and their average then display them **(6 marks)**
- e. With an example, explain how a C++ function is defined **(2 marks)**
- f. Write a C++ program which output even numbers and their squares in a tabular format. The even numbers being calculated range from 0 to 200 inclusive **(6 marks)**

No	Square
4	8
6	36
8	64

Question Two(20 marks)

- a. Using switch decision statement, write a C++ program which displays a choice of menu for user and prompts him/her to select an operation, based on selected operation (add, subtract, divide ,multiplication and quit), the program can make a decision to add two numbers entered by the user and display the output. The program keeps repeating the process until the user selects option of quitting **(8 marks)**
- b. Write an object oriented program which accepts three numbers and prints the largest out of the three. The program should make use of conditional operator and a user defined function which accepts the numbers and returns the largest to the calling code **(4 marks)**
- c. What is a recursive function? Write a C++ recursive function which calculate the factorial an integer n entered from the keyboard **(8 marks)**

Question Three (20 marks)

- a. Write a C++ program which makes use of functions to convert temperature from Celsius to Fahrenheit and vice versa. The program should display a menu for the user to select

either to convert the temperature to Celsius or Fahrenheit. Depending on the selected choice, the program should call the appropriate function and prompt the user to enter the temperature then display the temperature **(6 marks)**

- b. Explain any six stages involved while designing a computer program **(6 mark)**
- c. Mrs Waema has fifteen employee whose wages are paid at the end of each week. The basic salary is obtained by multiplying the number of hours worked by the rate of pay. Each employee is entitled to a compulsory saving scheme not exceeding Ksh 500 per month; also each gets a daily lunch allowance of Ksh. 200 and is then added to basic pay. The gross salary is deducted all other spending to get the net salary
- i. Generate a suitable flowchart to solve the above problem **(3 marks)**
- ii. Write a C++ program to implement the above pseudocode **(5 marks)**

Question Four (20 marks)

- a. Using the concepts of arrays, write a program that accepts the name, registration number and telephone number of students then stores these values in appropriate arrays. The program should read values of n students from the keyboard and assign them to the respective arrays and display them in the following tabular format **(10 marks)**

#	Regno	TelNo
1	1002	0729458623
2	1003	0735698425
3	1004	0708635231

- b. Write a C++ program which displays the real roots or the message “no real roots” of a quadratic equation whose formula is: **(10 marks)**

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