Machakos University College

(A Constituent College of Kenyatta University)
UNIVERSITY EXAMINATIONS 2013/2014
SCHOOL OF ENGINEERING

SPECIAL/SUPPLEMENTARY EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN ELECTRICAL AND ELECTRONICS ENGINEERING

EEE 102: COMPUTER PROGRAMMING I

DATE: 26TH AUGUST, 2014 **TIME:** 8.30 a.m. – 10.30 a.m.

Answer question ONE.

1. (a) (i) Outline rules followed when declaring variables in programming. (2 marks)

(ii) Jane a student in MUC wrote the following code during programming session.

```
#include <stdio.h>

int main();

      char  ch = 'A';
      char  str[20] = "fresh2refresh.com";
      float flt = 10.234;
      int no = 150;
      double dbl = 20.123456;
         printf("Character is %d \n", ch);
         printf("String is %s \n" , str);
         printf("Float value is %f \n", flt)
         printf("Integer value is %d\n" , no);
         printf("Double value is %lf \n", dbl);
         printf("Octal value is %o \n", no);
         printf("Hexadecimal value is %x \n", no);
      return 0;
}
```

Required

Identify **four** errors in the above program. (4 marks)

(b) (i) Explain each of the following terms as used in programming. (6 marks)

I. scanf
II. return 0;
III. printf.

(ii) Describe the role of algorithms in program development. (6 marks)

(c) Explain **two** reasons of writing comments during program coding. (4 marks)

(d) Write a C program that prompts a user to enter CAT mark and the EXAM mark, the CAT mark is marked out of 25 and converted to 30% and the EXAM mark is marked out of 100 and converted to 70%. The program then calculates the FCAT mark, FEXAM mark and the TotalEXAM mark (FCAT mark + FEXAM mark), and assigns a remark of PASS if TotalEXAM mark is greater than 40% else assigns a FAIL. The program then displays the TotalEXAM in two decimal places and the Remark. (8 marks)

Answer ANY TWO questions. all questions carry equal marks.

2. (a) With the aid of a diagram in each case, distinguish between each of the following control structures. (12 marks)

(i) **DO While** and **While** loops
(ii) **if ..else** and **Switch** statements

(b) Write a C assignment statement to evaluate the following equations (4 marks)

(i) Torque = $\frac{2m1m2}{m1+m2}xg$

(ii) Side = $\sqrt{a^2}+b^2-2abCOS(x)$

(c) The grading system in a certain university college is as follows:

Mark Range	**Remark**
0 to 39	FAIL
40 to 49	PASS
50 to 59	Credit 4
60 to 69	Credit 3
70 to 79	Distinction 2
80 to 100	Distinction 1

Required

Using a **SWITCH** statement, write a code to represent the above scenario. (4 marks)

3. (a) Distinguish between *continue* and *break* loop control structures as used in C programming. (4 marks)

(b) (i) Draw a flow chart that would be used to design a program that displays all even numbers between 10 and 100. (8 marks)

(ii) Write a C program to implement the flow chart drawn in (i). Use while loop control structure. (8 marks)

4. (a) Explain each of the following as use in programming. (4 marks)

(i) call by value;

(ii) call by reference

(b) (i) Describe **three** types of errors that can occur during program compilation and execution. (4 marks)

(ii) The following is a Pascal program written by a student in a programming class.

```
#include <stdio.h>
int main(){
    int n, count, sum=0;
    printf("Enter the value of n.\n");
    scanf("%d",&n);
    for(count=1;count<=n;++count)
    {
        sum+=count;
    }
    printf("Sum=%d",sum);
    return 0;
}
```

(I) Write the pseudo code that might have been used to develop the program. (3 marks)

(II) Assume that n = 19; evaluate the sum displayed when the program is executed. (7 marks)