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KIRIRI WOMEN'S UNIVERSITY OF SCIENCE AND TECHNOLOGY
UNIVERSITY EXAMINATION, 2024/2025 ACADEMIC YEAR
FIRST YEAR, FIRST SEMESTER EXAMINATION
FOR THE BACHELOR OF SCIENCE IN COMPUTER SCIENCE
KCS 101 – INTRODUCTION TO PROGRAMMING

Date: 11TH April 2024
Time: 11:30AM – 1:30PM

INSTRUCTIONS TO CANDIDATES

ANSWER QUESTION ONE (COMPULSORY) AND ANY OTHER TWO QUESTIONS

QUESTION ONE (30 MARKS)

- a) Explain why and when do we use *#define* and *#include* directive. (4 Marks)
- b) Comments are very important in structuring a program code. Explain why we use comments in programs. (4 Marks)
- c) Given two integers 20 and 10, write a program that uses the function add() to add these numbers and a sub() function to find the difference of these two numbers and then display the sum in the following format:
20 + 10 = 30
20 – 10 = 10 (6 Marks)
- d) Given the radius of a circle, write a program to compute and display its area. Use symbolic constant to define π value and assume a suitable value for radius. (6 Marks)
- e) Given the statement,
int a = 10, b = 20, c;
Determine whether each of the statements are true or false.
i) The statement a =+ 10, is valid
ii) The expression a+4/6*6/2, evaluates to 12.
iii) The statement a = 1/b; assigns the value 0.5 to a
iv) The expression a+3/2*2/3, evaluates to 20. (4 Marks)
- f) Identify syntax errors in the following program. After corrections, what output would you expect when you execute it? (6 Marks)

```
#include<stdio.h>
#define PI = 3.14159

int main()
{
    int R,C;           /* R- Radius of the circle*/
    float perimeter;  /*Circumference of the circle */
    float area;       /* Area of circle */
    C=PI
    R=5;
    Perimeter = 2.0 * C*R;
    Area = C*R*R;
    printf("%f", "%d",&perimeter, &area);
}
```

QUESTION TWO (20 MARKS)

- a) Write a C program to do the following: (10 Marks)
- Declare x and y as integer variables and z as a short integer variable.
 - Assign two 6 digit numbers to x and y.
 - Assign the sum of x and y to z.
 - Output the values of x, y, and z.

Comment on the output

- b) Find the output of the following program. (4 Marks)

```
main()
{
    int x = 100;
    printf("%d\n", 10 + x++);
    printf("%d\n", 10 + ++x);
}
```

- c) The price of 1 kg of rice is Ksh. 260 and 1 kg of sugar is Ksh. 210. Write a program that will get these values from the user and display the prices as follows: (6 Marks)

```
***LIST OF ITEMS***
Item          Price
Rice          Ksh. 260
Sugar         Ksh 210
```

QUESTIONS THREE (20 MARKS)

- a) Given an integer number, write a program that displays the number as follows. (10 Marks)
- First line: All digits.
Second line: All digits except first digit
Third line: All except the first two digits.

....

Last line: The last digit

Example, the number **3456**, will be displayed as:

3456

456

56

6

- b) What is the output of the following code segment? Briefly explain why the code does what it does. (8 Marks)

```
int x = 3, y = 5;
if (x > y);
printf("A");
if (x == 4)
printf("%d\n", x+y);
```

- c) Write a c program to output integers 5,10,15,20,25,30,35,40,45,50 using for loop control structure. (6 Marks)

QUESTION FOUR (20 MARKS)

- a) The volume of a sphere with radius **r** is $\frac{4}{3} * \pi r^3$. Complete the program below so that it prompts the user to enter the radius of a sphere and prints out the volume of that sphere to two decimal places. (8 Marks)

```

#include <stdio.h>
#define PI 3.14159265
int main()
{

    /* write your program statements here */

    return 0;
}

```

- b) Given the program code below, analyze it and give its output. (6 Marks)

```

int main()
{
    int m[] = {1, 2, 3, 4, 5};
    int x, y = 0;
    for (x=0;x<5;x++)
    {
        y = y + m[x];
        printf("%d", y);
    }
}

```

- c) Write a C program that prints the even numbers between 1 and 100. (6 Marks)

QUESTION FIVE (20 MARKS)

- a) Given the following segment of a program, write the output of the program after successful execution. (4 Marks)

```

char s1[] = "Kiriri";
char s2[] = "University";
strcpy(s1,s2);
printf("%s",s1);

```

- b) Write a program that reads your first name and last name from the keyboard separately and displays your full name as output. (6 Marks)
- c) You are given three positive integer numbers; a, b and c. Draw a well labeled flow chart and write an algorithm to find the largest of the three numbers. (10 Marks)