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KIRIRI WOMENS' UNIVERSITY OF SCIENCE AND TECHNOLOGY

UNIVERSITY EXAMINATION, 2022/2023 ACADEMIC YEAR
FIRST YEAR, SECOND SEMESTER EXAMINATION
FOR THE DEGREE OF BACHELOR OF BUSINESS INFORMATION TECHNOLOGY

Date: 27th July, 2022
Time: 8.30am –10.30am

KBI 2109 - FUNDAMENTALS OF PROGRAMMING

INSTRUCTIONS TO CANDIDATES

ANSWER **QUESTION ONE (COMPULSORY)** AND **ANY OTHER TWO** QUESTIONS

QUESTION ONE (30 MARKS)

a) Define the following terms as used in programming:

i) Compiler (1 mark)

ii) Programming language (1 mark)

iii) Object code (1 mark)

iv) Escape sequence (1 mark)

b) Highlight four disadvantages of low level programming language. (4 marks)

c) Discuss the main features of modular programming highlighting its key advantages. (6 marks)

d) Draw a flowchart for a program that calculates the area and the perimeter of a circle then displays results on the screen. (3 marks)

e) Write the codes for the above program in C language. (3 marks)

f) Suggest, with examples two ways in which constant values can be used in C expression statements. (4 marks)

g) Write a flowchart of a program that will output the words adult, teen or child based on the age. If age is below 13 years**, child**, age is between 13 and 19, **teen** else **adult**. (4 marks)

h) Write the psudocode that can be used to develop the above (a) program. (2 marks)

QUESTION TWO (20 MARKS)

a) Discuss the main steps of program development.
(8 marks)

b) Explain the three main types of language translators.
(6 marks)

c) Explain the main activities that takes place in Code Generation stage when compiling a program.
(6 marks)

QUESTION THREE (20 MARKS)

a) Define the term Algorithm.
(2 marks)

b) State four examples of reserved words used in C programming.
(4 marks)

c) State four rules of naming variables in C language.
(4 marks)

d) A retail shop offers discounts to its customers according to the following rules:
Purchase Amount >= Ksh. 10,000 - Give 10% discount on the amount.
Ksh. 5, 000 <= Purchase Amount < Ksh. 10,000 - Give 5% discount on the amount.
Ksh. 3, 000 <= Purchase Amount < Ksh. 5,000 - Give 3% discount on the amount.
0 > Purchase Amount < Ksh. 3,000 - Pay full amount.
Write a program that asks for the customer's purchase amount, then uses *if* statements to recommend the appropriate payable amount. The program should cater for negative purchase amounts and display the payable amount in each case.
(10 marks)

QUESTION FOUR (20 MARKS)

a) Explain the main advantages of C programming language over other Languages.
(6 marks)

b) From the following program, suggest the syntax and logical errors that may have been made.
(4 marks)

```
#include<stdio.h>
main()
{
        int , int n2, n3;
        n = 5;
        n2 = n *n
        n3 = n2 * n2;
        printf(" n = %d, n squared = %d, n cubed = %d \ n", n, n2, n3);
        return 0;
}
```

c) Differentiate between the While and the Do While loops, giving the general sysntax.
(4 marks)

d) Write a C program using the while loop that displays numbers 1 to 10 on the screen.
(6 marks)

QUESTION FIVE (20 MARKS)

a) Explain the importance of the following functions in a C program.

Main() (2 marks)

Printf() (2 marks)

Scanf() (2 marks)

b) C is both 'portable' and 'efficient'. Explain.

(6 marks)

c) The roots of a quadratic equation $\mathbf{ax^2 + bx + c = 0}$ can be evaluated as:

$\mathbf{x1 = (-b + \sqrt{(b^2 - 4ac)})/2a}$

$\mathbf{x2 = (-b + \sqrt{(b^2 - 4ac)})/2a}$

where a, b ,c are double type variables and b^2 = b * b , 4ac = 4 * a * c, 2a = 2 * a.

Write a program that calculates the two roots $\mathbf{x_1, x_2}$ with double precision, and displays the roots on the screen. (8 marks)

d) Give four examples of reserved words in c
e) Highlight the six main components of a C program.
f) Define the term function
g) Explain the term Preprocessor directives as used in C language, give an example.

h) The use of comments in C programs is generally considered to be good programming practice. Why?
i) Describe the following data types as used in c language:
j) Void
k) Double
l) String
m) Write a program that inputs two floating-point numbers (use type **float)** and then displays their sum.
n) Write a program that computes the volume of a cube. Have the program prompt the user for each dimension.
o) Differentiate between local variable and global variable.

p) Write a program that computes the number of seconds in a year.
q) Discuss the three main types of control structures
r) 1In what circumstance is the *continue* statement used in a C program?

s) Using a nested if statement, write a program that prompts the user for a number and then reports if the number is positive, zero or negative.
t) Write a *while* loop that will calculate th*e* sum of every fourth integer, beginning with the integer 3 (that is calculate the sum 3 + 7 +11 + 15 + ...) for all integers that are less than 30.
u) Define the term arrays and highlight its main characteristics.
v) State the components of an array definition
w) Differentiate between automatic array and external array.
x)