KASNEB

CICT PART II SECTION 3

STRUCTURED PROGRAMMING

THURSDAY: 25 May 2017. **Time Allowed: 3 hours.**

Answer ALL questions. Marks allocated to each question are shown at the end of the question.

ALL programs written should be in C programming language.

QUESTION ONE

(a) Highlight four rules for naming a variable in C programming language. (4 marks)

(b) Explain the output of the following program statements in reference to the variable x:

(i) printf ("%ld", x); (2 marks)

(ii) printf ("%ld", &x); (2 marks)

(c) Distinguish between "type checking" and "exception handling" concepts as used in structured programming. (4 marks)

(d) The table below shows the retail prices and quantities of five different products available for sale:

Product name	Quantity	Retail price (Sh.)
A	10	3.50
B	4	8.42
C	6	3.45
D	2	6.25
E	7	1.25

Required:

Using "arrays", write a C program that calculates and displays the total cost of buying all the products. (8 marks)

(Total: 20 marks)

QUESTION TWO

(a) Outline four advantages of modular programming. (4 marks)

(b) Differentiate between the following terms in relation to structured programming:

(i) "Reserved words" and "defined constants". (4 marks)

(ii) "Program linking" and "program loading". (4 marks)

(iii) "Structure" and "union". (4 marks)

(c) Rewrite the following program using a "do... while" loop to get the same result:

```
#include <stdio.h>
void main ( )
{
        int count = 1;
        while (count < = 5)
        {
                printf ("%d \n", count);
                count++;
        }
}
```

(4 marks)

(Total: 20 marks)

QUESTION THREE

(a) Highlight three disadvantages of programming in machine language. (3 marks)

(b) Explain the meaning of each of the following keywords used in C programming:

(i) extern. (2 marks)

(ii) default. (2 marks)

(iii) volatile. (2 marks)

(iv) continue. (2 marks)

(c) Giving an example in each case, distinguish between "variable declaration" and "variable definition". (4 marks)

(d) Write a C program that checks whether an input is a prime number then displays the result. (5 marks)

(Total: 20 marks)

QUESTION FOUR

(a) (i) Explain the meaning of an emulator as used in mobile application development. (2 marks)

(ii) List four examples of emulators used in mobile application development. (4 marks)

(b) Describe two types of technical manuals that could be used to support a large program. (4 marks)

(c) Study the program segment given below:

```
#include<stdio.h>
int main ( )
{
        int i, j;
        char C = '*';

        for (i = 1; i <10; i++)
        {
                for (j = i; j<10;j++)
                        {
                                printf("%c", C);
                        }
                        printf("\n");
        }

        return 0;

        }
```


Required:

(i) Highlight the role of the pre-processor directive in the above program segment. (2 marks)

(ii) Explain the importance of "%c". (1 mark)

(iii) State the number of executions for the outer loop. (2 marks)

(iv) Specify the function of { } delimiter as used in the above program segment. (2 marks)

(v) Write the output of the program. (3 marks)

(Total: 20 marks)

QUESTION FIVE

(a) Explain three errors that could occur during file I/0 operations in a program. (6 marks)

(b) Using an illustration:

(i) Declare an uninitialised pointer P. (2 marks)

(ii) Initialise a null pointer P. (2 marks)

(c) Distinguish between "r+" and "a+" file open modes. (4 marks)

(d) Study the program segment given below:

```
include < stdio.h>

int     main    ( )

{

        int x, y;

        double enum;

        int div  =  0;

        y     =  0;

        printf("Enter a value:");

        scanf("%d", & x)

        return  0;

}
```

Required:

Explain three types of errors the program will encounter during execution. (3 marks)

(e) Highlight three advantages of using integrated development environment (IDE) for coding. (3 marks)

(Total: 20 marks)

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