

# 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 ("%d", x);` (2 marks)
- (ii) `printf ("%d", &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/O 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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