kasneb

CICT PART II SECTION 3

STRUCTURED PROGRAMMING

FRIDAY: 27 November 2020.   **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)   Define each of the following terms as used in structured programming:

         (i)   Delimiter.   (2 marks)

         (ii)   Storage class.   (2 marks)

(b)   XTZ company has approached you to design a program for them from scratch.

         Required:
         Highlight four design tools that you could use in this task.   (4 marks)

(c)   The following is a C program code created by a student at Bidii College:

```
# conclude (iostream.h>
int void main [ ]
{ int k, L;
fprintf "Enter two non integers';
scanf (" % d  % c, & K, & L);
cout ("ln sum = %f multiplication = %d ln" K + L, K *L);
}
```

         Required:
         Rewrite the program by correcting the errors.   (6 marks)

(d)   Complete the table below by filling the purpose of the string functions as used in C programming language.

	String function	Purpose
(i)	strcat ( )	
(ii)	strcmp ( )	
(iii)	strcpy	
(iv)	strlen	

                                                                              (4 marks)

(e)   Identify the error in the following code:
```
int main ( )
  { int  value;
      value = 0;
    double value;
      value = 0.0;
  }
```

                                                                              (2 marks)
                                                                     (Total: 20 marks)

QUESTION TWO

(a) Describe each of the following mobile application development practices:

    (i) Single platform development. (2 marks)

    (ii) Cross platform development. (2 marks)

(b) Distinguish between the following terms as used in structured programming:

    (i) "Top-down programming methodology" and "bottom-up programming methodology". (4 marks)

    (ii) "Local variable" and "global variable". (4 marks)

(c) Study the code segment below:

```
int x   =   30;
int y   =   x++;
```

Required:

    (i) Rewrite the segment using prefix increment statement. (1 mark)

    (ii) Evaluate the values of x and y after rewriting the segment. (2 marks)

(d) Marion a programmer, would like to develop a program for a client.

Required:

    (i) Highlight three non-linear data structures that she could use. (3 marks)

    (ii) Outline two benefits that she would realise from using non-linear data structures in the program. (2 marks)

(Total: 20 marks)

QUESTION THREE

(a) Kango wrote a program using C programming language to compute the value of Z in the expression:

$$Z = (A * B\% C)(x - y)$$

Required:

    (i) Explain the type of error that is likely to occur when the value of x is equal to the value of y. (2 marks)

    (ii) Write a C program statement which could be used to capture the error in (a) (i) above. (2 marks)

(b) Write a program in C language that prompts the user to input a person's date of birth and the current date in terms of day, month and year. The program then calculates and returns the age of the person in the same format using a function. (6 marks)

(c) Explain the meaning of the following files in the context of file management:

    (i) a.exe (1 mark)

    (ii) a.o (1 mark)

    (iii) a.obj (1 mark)

    (iv) a.c (1 mark)

(d) Citing the purpose of each, state the name of each of the following expressions in C programming language:

    (i)   \a   (1 mark)

    (ii)   \r   (1 mark)

    (iii)   \b   (1 mark)

    (iv)   \?   (1 mark)

(e) Describe the purpose of a function prototype.   (2 marks)

(Total: 20 marks)

QUESTION FOUR

(a) Explain the meaning of the following commands, typically available in most integrated development environments:

    (i)   Build.   (2 marks)

    (ii)   Run.   (2 marks)

    (iii)   Abort.   (2 marks)

(b) Study the loop below

int a [10] = {4, 1, 1, 1, 3, 4, 5, 6, 7, 7}

int k = 0, i = 0

for (i = 0; i <= 9; i + +) {

k = + a [i];

}

Required:

    (i)   Rewrite the loop above using a decrementing FOR loop operator.   (4 marks)

    (ii)   State the final value of k after the iteration.   (2 marks)

(c) Explain the two parameters of scanf ( ) function.   (4 marks)

(d) Differentiate between each of the following C functions:

    (i)   strcpy and strncpy.   (2 marks)

    (ii)   strlwr and strupr.   (2 marks)

(Total: 20 marks)

QUESTION FIVE

(a) List three reasons why structured programs use functions.   (3 marks)

(b) Write a C program to illustrate how to call a function named MyFunc with two parameters "a" and "b" by value. The function adds two integer x and y declared in main, such that, a = x + y and b = y.

    Your output should be as shown below:
        In myfunc, a = 95   b = 70
        In main   x = 25   y = 70

                                                            (6 marks)

(c)   "A mobile phone is a computer".

Required:
Justify this statement using three points.   (6 marks)

(d)   A novice programmer wrote the following C program to calculate area and perimeter of a circle:

```
# include < sdio.h>
# include < enio.h>

void  main ( )

        int  ri
        float  pi = 3.142, area, ci;
        printf ("Enter radius of a circle");
        scanf (r);
        area = pi x r  x  r;
        printf ("Area of circle = %d" area);
        ci = pi * r;
        printf ("circumference = %d" c(i);
        getch ( ) ;
}
```

Required:
Rewrite the above program without errors.   (5 marks)
                                                                         (Total: 20 marks)

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