2022

ELECTRONICS — HONOURS

Paper : CC-4

(C Programming and Data Structures)

Full Marks : 50

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Answer ***Question No.* 1** and ***any four*** questions from the rest.

1. Answer ***any ten*** questions : 1×10

(a) An example of a macro in C is

(i) define (ii) refine

(iii) goto (iv) array

(b) The operation $x+=2$ means

(i) $x+2=x$ (ii) $x=x+2$

(iii) $x+2=2$ (iv) None of these.

(c) int $x=3.1415$; the resultant value of x would be

(i) NaN (ii) 3.0

(iii) 3 (iv) 3.1415

(d) If $a<100$, then the expression $(a/100)*100$ would result in

(i) 0 (ii) 1

(iii) 100 (iv) None of these

(e)
```
int  x=2,  y=4;
y=x++;
printf("%d  %d",  x,  y);
```

The output on the screen would read

(i) 3 2 (ii) 2 4

(iii) 3 3 (iv) 4 4

(f) In C, function parameters are passed by

(i) reference (ii) value

(iii) both (iv) neither of the two

(g) Struct is a

(i) primitive data type (ii) derived data type

(iii) extended data type (iv) All of these

(h) Which of the following is a valid pointer declaration?

(i) int *p; (ii) int* p;

(iii) int * p; (iv) All of these.

(i) Every string in C ends with

(i) a semicolon (ii) a colon

(iii) a null character (iv) None of these.

(j) In which type of linked lists traversals can be performed in both directions?

(i) Singly linked lists (ii) Double linked lists

(iii) Circular linked lists (iv) None of these.

(k) Which of the following is not a stable sorting algorithm?

(i) Bubble sort (ii) Insertion sort

(iii) Selection sort (iv) All of these.

(l) What is the other name for postfix expression?

(i) Infix notation (ii) Polish notation

(iii) Reverse Polish notation (iv) Reverse Infix notation

2. Define a token in C. Name the different tokens in C. What is the difference between a keyword and an identifier in C? Give one example of each. Name the primitive data types in C. 2+2+2+2+2

3. (a) Write two advantages and disadvantages of C-language.

(b) What is a character set in C-language and how are they classified?

(c) Find the identifiers in the following C-program.

```
void  main()
{
int  a  =  25;
char  b;
}
```

(d) Write a program in C-language that can add two integers and produces a result in integer, long integer, float and long float styles. (1+1)+(1+1)+2+4

4. What are bitwise operators in C? Explain with an example the bitwise shift-left operation in C. What is meant by operator precedence and associativity? What would the result of the following expressions in C be?

   (a) 100 + 200 / 10 – 3 * 10

   (b) 7 + 3% 4 / 2 2+2+2+2+2

5. What is meant by implicit type conversion in C? What is type-casting in C? What is an array? Explain with an example, how you may declare and initialize a 2 dimensional array having 2 rows and 3 columns in C. Name the different types of loops in C. What does the break; statement do? 2+2+1+2+2+1

6. (a) Write the difference between "if" and "if-else" statements.

   (b) What is a nested loop? How is it used?

   (c) Write a program in C-language that can return the square root of a number without using the function calling technique and modify the same program using the function calling technique.
   2+(1+2)+(2+3)

7. What is a function? What is the difference between a library function and a user defined function? Give two examples of a library function in C. Write a C program using a function to calculate the volume of a rectangular box. The length, breadth and height of the box are to be read from the keyboard and passed to the function when it is called. 1+2+2+5

8. What is meant by the structure data type in C? Write a C program using a structure called book to store book details like title, author and year of publication. Create two variables of type struct book and read in the corresponding values of the structure variables from the keyboard. What is a pointer? Mention two characteristics of object oriented language. 2+5+1+2