Jharkhand University of Technology, Ranchi

B.Tech. 2nd Semester Examination, 2018

(Held in May, 19)

Subject : Programming for Problem Solving

Subject Code : ESC–103

Time Allowed : 3 Hours

Full Marks : 70

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

The figures in the margin indicate full marks.

Answer any five *questions.*

Attempt either MCQ or question present in OR section.

MCQ Section

1. Select the most appropriate option for the following questions:

2×7=14

(i) The minimum number of temporary variables needed to swap the contents of two variables is

(a) 1   (b) 2

(c) 3   (d) 0

(ii) The statement `printf("%d", 10?0?5:11:12);` prints

(a) 10   (b) 0

(c) 12   (d) 11

(iii) Which one is not a reserve keyword in C language?

(a) Auto   (b) Main

(c) Case   (d) Register

(iv) Macro Processing is done during

(a) compile time   (b) load time

(c) run time   (d) link time

(v) Structures in 'C' support

  I. Call by Value

  II. Call by Reference

(a) Only I   (b) Only II

(c) Both I and II   (d) None of these

(vi) '$a \rightarrow b$' is syntactically correct if

(a) a and b are structures.

(b) a is a structure and b is a pointer to a structure.

(c) a is a pointer to a structure and b is a structure.

(d) a is a pointer to a structure in which b is a field.

Please Turn Over

(vii) What does the following fragment of C program print?

```
Char c[] = "TECH2019";
Char *p=c;
Printf("%s",p+p[3]-p[1]);
```

   (a) TECH2019   (b) H2019

   (c) 2019   (d) 019

OR Section

1. (a) Discuss about the main components of a Computer System with the help of a block diagram.

   (b) What is the use of 'FLOWCHART' AND 'PSEUDOCODE'? Draw a FLOWCHART to compute the factorial of a number.

   (c) What are reserved words? Can the meaning of reserved words be redefined by the user in general?   6+6+2=14

2. (a) Explain the concept of 'Call-by-Value' and 'Call-by-Reference' mechanism with corresponding examples.

   (b) Write the output of following program fragments:

```
(i)  void main()                        (ii)  void main()
     {                                         {
       int i=2;                                  int i=1,j=1;
       switch(i)                                 for( ; ; )
       {                                         {
       Case 1: printf("Mid Sem 1 \n");              if(i>5)
       Case 2: printf("Mid Sem 2 \n");                break;
       Case 3: printf("Final Sem  \n");             else
       Default: printf("Summer Vacation \n");         j+=i;
       }                                            Printf("\n%d",j);
     }                                              i+=j;
                                                 }
                                               }
```

   (c) What is meant by a 'pointer to a pointer'? Can this be extended to any level?   6+6+2=14

3. (a) What is meant by Operator Precedence? Write the relative precedence of six unary operators.

   (b) What is meant by associativity of operators? Discuss the role of associativity in calculating the result of the expression "4/2/2".

   (c) Write a program to check whether a given decimal number is palindrome or not.   4+5+5=14

4. (a) Write a program to implement insertion sort. Sort the numbers {4, 1, 7, 3, 2} in ascending order using insertion sort and show the output of each iteration.

   (b) Explain the difference between a pointer to a constant and a constant pointer with examples.

   (c) What is the benefit of writing program using functions?   8+3+3=14

5. (a) What is the benefit of storing strings as an 'array of pointers' over a 'two-dimensional character array'? Support your logic with proper coding examples.

   (b) Write a program to demonstrate the mechanism of passing the address of a structure variable to a function.

   (c) Show the use of "strcat(), strcmp(), strcpy() and strlen()" functions with proper examples.   5+5+4=14

6. (a) Write the differences between recursion and iteration.   4

   (b) Write the pseudo code to implement merge sort. Sort the numbers (4, 1, 7, 3, 2) in ascending order using written code of merge sort and count the total number of function calls made during sorting.   4+4+2=10

   4×3.5=14

7. Write short notes on the following differences:

   (a) Array vs. Structure

   (b) Switch vs. if-else Ladder

   (c) continue vs. goto keyword

   (d) While vs. Do-while loop