(Following Paper ID and Roll No. to be filled in your Answer Books)

Paper ID : 2012297   Roll No.

B.TECH.

Regular Theory Examination (Odd Semester - I), 2016-17

COMPUTER SYSTEM & PROGRAMMING IN 'C'

Time : 3 Hours   *Max. Marks : 100*

Section - A

1.   Attempt all parts. All parts carry equal marks. Write answer of each part in short.   (10×2=20)

  a)   Explain the basic structure of a C program.

  b)   What do you mean by Algorithm? Explain the characteristics of algorithm.

  c)   What are functions? What is the advantage of using multiple functions in a program?

  d)   Distinguish between - int main ( ) and void main ( )?

  e)   What is the difference between pseudo code and flow chart?

  f)   Draw the memory hierarchical structure of a computer system.

g) What will be the output of following code?

Void main ( )

```
{
    int a = 5, b = 6;
    printf("%d\t", a = b);
    printf("%d\t",a == b);
    printf("%d\t%d", a, b);
}
```

h) Write short notes on High level and low level languages.

i) Write short notes on Union and enumerated data type.

j) Write the five commands of LINUX with its architecture ?

Section - B

2. **Attempt any five questions from this section.**

(5×10=50)

a) i) What is the role of SWITCH statement in C programming language. Explain with example.

ii) What is recursion? Write a program in C to generate the Fibonacci series.

b) i) Differentiate between -
   1) actual and formal arguments.
   2) global and extern variables.

ii) Describe about the basic components of a computer with a neat block diagram.

c) i) What do you mean by dynamic memory allocation? Explain the malloc() and calloc() function in detail.

ii) Write a program to multiply two matrices of dimension 3*3 and store the result in another matrix.

d) Convert the following number into :
   i) $(10101011101.011)_2 = (?)_{16}$
   ii) $(916.125)_{10} = (?)_4$
   iii) $(123)_{10} = (?)_2$
   iv) $(574.32)_8 = (?)_2$
   v) $(1011.10)_2 = (?)_{10}$

e) i) Write a program to print all prime numbers from 1 to 300.

ii) Any year is input through the keyboard. Write a program to determine whether the year is a leap year or not.

f) What do you mean by parameter passing? Discuss various types of parameter passing mechanism in C with examples.

g) i) Define data types in C. Discuss primitive data types in terms of memory occupied, format specifier and range.

ii) Write a program to print the following pattern:
   A
   AB
   ABC
   ABCD
   ABCDE
   ABCDEF

h) List out various file operations and modes in C. Write a program to copy the content from one file to another file.

Section - C

Attempt any two questions from this section.

$(2 \times 15 = 30)$

3. a) What do you mean by sorting. Write a program in C to sort the given n positive integers. Also give the flow chart for the same.

 b) Write a program to check whether a given number is Armstrong or not. Like $153 = 1^3 + 5^3 + 3^3$.

4. a) Define a structure? Write a program in C to create a data base of fifty students to store personal details such as roll no., name and marks. Print all the details of students whose name is entered by the user.

 b) What do you mean by macro? Explain types of macro with its example.

5. a) What do you mean by pointers? How pointer variables are initialized? Write a program to sort a given numbers using pointers.

 b) A five digit positive integer is entered through the keyboard. Write a C function to calculate sum of digits of the 5-digit number :

 i) Without using recursion.

 ii) Using recursion.

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