

## B.TECH.

**THEORY EXAMINATION (SEM-II) 2016-17**  
**COMPUTER SYSTEM & PROGRAMMING IN 'C'**

Time : 3 Hours

Max. Marks: 70

Note : Be precise in your answer. In case of numerical problem assume data wherever not provided.

## SECTION - A

7 x 2 = 14

1. Explain the following:

- (a) Write differences between Compiler and Interpreter.
- (b) Write any three differences between Application software and System software?
- (c) Differentiate between structure and union.
- (d) In C programming what will be the value of a, if  $a = b \% c$ , where  $b = -13$  and  $c = 5$ ?
- (e) Differentiate between static and register storage class in C language.
- (f) What is an enumerated data type in C language? Explain.
- (g) Explain the memory hierarchy of a computer system.

## SECTION - B

7 x 3 = 21

2. Attempt any three of the following questions:

- (a) What is an algorithm? Give the characteristics of an algorithm. Write an algorithm for printing table of a given positive integer also draw the flow chart for the same.
- (b) Write a program to sum the series  $\frac{1}{2} + \frac{2}{3} + \frac{3}{4} + \dots + \frac{n}{n+1}$
- (c) What is recursion? Write a program in C to generate the Fibonacci series using recursion.
- (d) Convert the following:
  - (i)  $(478A)_{16} = (?)_{10}$
  - (ii)  $(44)_5 = (?)_7$
  - (iii)  $(3142.28)_{10} = (?)_2$
  - (iv)  $(11001100.10)_2 = (?)_{16}$
  - (v)  $(678)_{10} = (?)_3$
- (e) A company gives insurance to its drivers in the following cases:
  - (i) If the driver is married.
  - (ii) If the driver is unmarried, male & above 30 years of age.
  - (iii) If the driver is unmarried, female & above 25 years of age.
 In all other cases, the driver is not insured. If the marital status, gender and age of a driver are inputs, write a program to determine whether the driver is to be insured or not.

## SECTION - C

7 x 5 = 35

Attempt the following questions:

3. Attempt any two of the following:

- i. Write a program to add two matrices A and B of real numbers having dimension 3X3 and store the result in another matrix..
- ii. Explain call by value and call by reference mechanism for function call using proper example.
- iii. Discuss various functional components of digital computer.

**4. Attempt any two of the following:**

- i. What do you mean by pointers? How pointer variables are initialized? Also write a note on pointer arithmetic with proper example in C language.
- ii. A five digit number is entered through the keyboard. Write a program to obtain the reversed number and to determine whether the original and reversed numbers are equal or not.
- iii. Write a note on various approaches to problem solving.

**5. Attempt any two of the following:**

- i. Write a program to sort an array of integers in ascending order using bubble sort.
- ii. What is an operating system? Discuss its various functions. Also Compare between Linux and Windows OS.
- iii. Discuss the various classifications of computer systems.

**6. Attempt any two of the following:**

- i. What do you mean by macro? What are the applications of macros? Explain types of macro with suitable its examples in C language.
- ii. Write a program to count the number of characters, spaces and new lines in a text file.
- iii. Write a program in C to display the prime numbers between 1 and 100.

**7. Attempt any two of the following:**

- i. Write a program to check whether a given number is Armstrong or not for example:  
 $153=1^3+5^3+3^3$
- ii. What do you understand by conditional compilation? Explain it with an example in C language.
- iii. What are different data types of operators in C language? Also write a note on operator precedence in C.