C PROGRAMMING AND DATA STRUCTURE - A

Time : Three Hours]   [Maximum Marks : 70

Note : Attempt *one* question each from Sections A, B, C, and D,and the entire Section E. All questions carry equal marks.

Section : A

1. (a) What are Conditional operators ? What is their important ? Are they different from Bit-wise operators ?
    (b) Write a program in C, to find whether a given character is an alphabet or a numeral. Further, also distinguish whether the numeral is even or odd, and in case of alphabet whether it is a vowel or not.

2. (a) Compare do-while and for statements. Give exampleof a single program wrieen in both the statements.
    (b) Write a program in C to find the roots of a quadratic equation; make use of case statement.
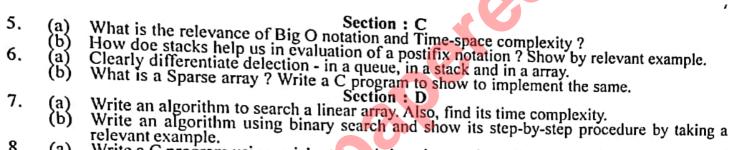
Section : B

3. (a) What are Functions ? What are their advantages and limitations ?
    (b) What is a Prototype ? What are their advantages and limitations ? Write the relevant C program.

4. Write a program in C to find NCR = N!/{(N – R)! * R!}, using a function to calculate the factorial of a number.

Section : C

5. (a) What is the relevance of Big O notation and Time-space complexity ?
    (b) How doe stacks help us in evaluation of a postifix notation ? Show by relevant example.
6. (a) Clearly differentiate delection - in a queue, in a stack and in a array.
    (b) What is a Sparse array ? Write a C program to show to implement the same.

Section : D

7. (a) Write an algorithm to search a linear array. Also, find its time complexity.
    (b) Write an algorithm using binary search and show its step-by-step procedure by taking a relevant example.
8. (a) Write a C program using quick sort, and show its step-by-step procedure by taking a relevant example.
    (b) Compare between Bubble sort and Insertion sort.

Section : E

9. Write short notes on the following :
    (a) User defined data tyeps in C.   (b) Storage classes in C.
    (c) Basic operations on a data Structure.   (d) Passing arguments to a function.
    (e) Structure and Union in C.