Answer all questions. Each question carries 2 marks.

1. "In the case of Von Neumann architecture, both the program and the data are stored in RAM". What is the disadvantage of this?

2. Find the decimal equivalent of the BCD number 1001 0101 0010 0111.

3. What is debugging? Give the name of a debugger.


5. Write an algorithm to count the negative numbers in the given set of n numbers.

6. Arrange the following operators in the increasing order of precedence (priority)
   
   ++ / >= &&

7. Write the syntax of for loop.

8. Mention the advantage of Binary search over Linear search.


10. What are the data types of the two arguments of the main function of a C program?
PART - B

Answer any one full question from each Module. Each question carries 20 marks.

Module – I

11. a) Compare primary and secondary storages in terms of speed of access, cost per byte, power requirements and the technology used.  
   b) With a block diagram explain the functional units of a computer.  
   c) Find the result.  
      i) \((1010 \ 1101)_2 - (1100 \ 1101)_2\) using 2's complement  
      ii) \((1101 \ 1101)_2 \times (1000 \ 1000)_2\)  
      iii) \((1110 \ 1100)_2 ÷ (1000 \ 0000)_2\)  

   OR

12. a) Find the normalized results.  
      i) \(0.1100 \ 1010 \ E \ 0000 \ 1001 + 0.1010 \ 1111 \ E \ 0000 \ 0011\)  
      ii) \(0.1001 \ 1000 \ E \ 0001 \ 0000 - 0.1111 \ 0011 \ E \ 0000 \ 1111\)  
      iii) \(0.1010 \ 1000 \ E \ 0000 \ 1100 \times 0.1110 \ 0000 \ E \ 0001 \ 0000\)  
   b) Describe ASCII and EBCDIC codes.  
   c) Change the base:  
      i) \((253.75)_{10}\) to Binary  
      ii) \((101101.11)_2\) to Hexadecimal  
      iii) \((737.421)_8\) to Decimal.

Module – II

13. a) Compare Assembly Language, Machine Language and High level language.  
   b) Discuss how modular programming is amenable to top down design strategy.  
   c) Draw the flowchart to find the sum of positive numbers and the sum of negative numbers in the given set of n numbers. Then add these sums to find the grand total.  

OR

14. a) Discuss the purpose of the various symbols and shapes used in flow charts.  
   b) Write an algorithm to generate the first n Fibonacci numbers.  
   c) Differentiate between compiler and Interpreter.
Module – III

15. a) Write a C program to find $X = Y + kZ$ where $X$, $Y$ and $Z$ are $n \times n$ matrices and $K$ is an integer.  

b) What is the difference between using `< >` and `" "` for including a header file?  

c) Write a C program to search for an element in the given array. Display the position(s) and the number of occurrence of the element.  

OR

16. a) Write a C program to read a string and check whether it is a palindrome or not.  

b) Illustrate the difference between structure and union.  

Module – IV

17. a) Write functions for Push and Pop operations. Assume a global integer array ‘stack’ and a global integer variable ‘top’.  

b) Write a C program that reads two strings, dynamically allocate memory and store the concatenation of these strings. Display the resultant string.  

c) Write a recursive function with an integer parameter $n$, to return the factorial of $n$.  

OR

18. a) Illustrate the use of `->` operator. Mention an alternate combination of operators that serve the same purpose.  

b) Explain the different storage classes in C.  

c) Write a C program that reads the contents of a file and writes the same to a new file.