2022

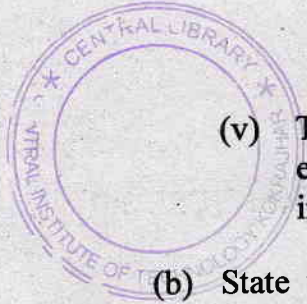## PROGRAMMING FOR PROBLEM SOLVING

Full Marks – 100

Time – Three hours

The figures in the margin indicate full marks
for the questions.

Answer any *five* questions.

1. (a) Fill in the blanks : 1×5=5

   (i) _____ is the only ternary operator
   in C.

   (ii) Void is an example of a _____
   in C.

   (iii) A for loop without test condition is
   known as _____ loop.

   (iv) The _____ function is used to
   determine the length of a string.

[Turn over

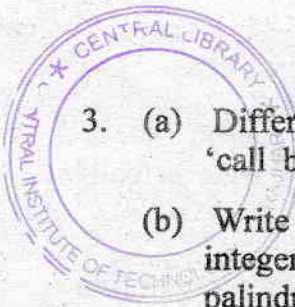(v) The _____ statement when executed in a switch statement causes immediate exit from the structure.

(b) State whether the following statements are true or false :   1×5=5

    (i)   An exit-controlled loop is executed minimum one time.

    (ii) It is not possible to directly compare two structure variables.

    (iii) It is necessary to initialize the array at the time of declaration.

    (iv) A function cannot be defined inside another function.

    (v)   If the two strings are found to be unequal then *strcmp* returns the difference between the first non-matching pair of characters.

(c) Briefly answer the following questions :
                                      1×3=3

    (i)   What will happen if in a C program you assign a value to an array element whose subscript exceeds the size of array ?

    (ii) What does the following declaration mean ? int (*ptr)[10].

3. (a) Differentiate between 'call by value' and 'call by reference' with example. 10

 (b) Write a C program to find the reverse of an integer number and check whether it is palindrome or not. 10

4. (a) What is string ? Write a C program that reads a sentence and prints the frequency of each of the vowels. 1+7=8

 (b) What are actual parameters and formal parameters ? Illustrate with examples. 4

 (c) Write a C function is prime(num) that accepts an integer argument and returns 1 if the argument is a prime or 0 otherwise. 8

5. (a) What is a pointer ? Give the advantages and disadvantages of pointer data type. 2+3=5

 (b) Define a recursion. Write a C program to find the factorial of a number using recursion. 1+7=8

 (c) Write a C program to read N integers into an array and to find the

 (i) sum of odd numbers

 (ii) sum of even numbers

 (iii) average of all numbers. Output the results computed with appropriate headings. 7

6. (a) What is a file ? How is a file opened and closed ? Explain getc() and putc() functions.

2+4+4=10

(b) Write a C program to multiply two matrices $A_{3 \times 4}$ and $B_{4 \times 3}$

10

7. (a) Explain the role of C preprocessor. 4

Or

Write a program to print the sum of the following series : 4

$1+1/2+1/3+1/4+\ldots\ldots+1/n$.

(b) Write a C program to maintain a record of N students details using an array of structures with four fields (roll no, name, marks, grade). Assume appropriate data type for each field. Then display all the records.

10

(c) Explain the differences between break and continue statements with suitable examples.

6