BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

CLASS: B.TECH./ I.MSC.
BRANCH: CSE/AIML/ECE/EEE/MATHS

SEMESTER : II
SESSION : SP/2024

SUBJECT: CS101 PROGRAMMING FOR PROBLEM SOLVING

TIME: 3 Hours

FULL MARKS: 50

INSTRUCTIONS:

1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
4. Before attempting the question paper, be sure that you have got the correct question paper.
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

			CO	BL
Q.1(a)	Write an algorithm and draw the corresponding flow chart to display the total electricity bill charges of the month depending upon the number of units consumed by the customer as per the following criteria: • for the first 100 units @ Rs. 5 per unit • for next 150 units @ Rs. 10 per unit • more than 250 units @ Rs. 20 per unit Also add meter charges of Rs. 75 per month to calculate the total electricity bill.	[5]	1	3
Q.1(b)	Illustrate different categories of data types and operators in C with examples.	[5]	2	1,2
Q.2(a)	Explain different categories of loops and their applications in C with examples.	[5]	2	2
Q.2(b)	Write a program to compute the square root of a series of numbers and display the results with a total count of negative numbers (if any). The program stops when the number 9999 is typed in. In case, the series contains any negative numbers, the process of evaluation of square root should be bypassed for such numbers.	[5]	3	3
Q.3(a)	Write a C program that inputs a polynomial p(x) of maximum degree 3 by reading its coefficients in an array and then evaluates the polynomial at various values of x. Also print this polynomial.	[5]	4	3
Q.3(b)	Illustrate the bubble sort technique for sorting an array with its implementation.	[5]	2	1,2,3
Q.4(a)	Differentiate between the call by value and call by reference with suitable program segments.	[5]	2	4
Q.4(b)	Specify the characteristics for problems that lend themselves to a recursive solution. Write a recursive function that take n (n>0) words as input and print them in reverse order on separate lines and explain its working with an example.	[5]	5	1,2,3
Q.5(a)	Why do we require a self-referential structure? Explain. Write a program to create a linear linked list interactively and print out the list and the total number of items in the list.	[5]	3	2,3
Q.5(b)	Write a program to open a file named INVENTORY which is received as command line argument and store in it the following data: Item name — Item number — Price — Quantity AAA-1 — 111 — 18.00 — 115 BBB-2 — 125 — 36.00 — 75 CCC-3 — 247 — 32.00 — 104 Extend the program to read this data from the file INVENTORY and display the inventory table with the value of each item.	[5]	3	3

:::::29/04/2024:::::E