

Code: 20ES1106

I B.Tech - I Semester – Regular Examinations - FEBRUARY - 2023

PROGRAMMING FOR PROBLEM SOLVING USING C

(Common for AIML, DS)

Duration: 3 hours

Max. Marks: 70

Note: 1. This paper contains questions from 5 units of Syllabus. Each unit carries 14 marks and have an internal choice of Questions.

2. All parts of Question must be answered in one place.

BL – Blooms Level

CO – Course Outcome

			BL	CO	Max. Marks
UNIT-I					
1	a)	Define algorithm, flowchart, input and output. Explain various symbols of flowchart.	L2	CO1	7 M
	b)	Draw the flowchart for solving the following problem: The algorithm reads the following two parameters – (i) Type of the vehicle, (<i>'M' or 'm' for motorbike, 'C' or 'c' for car, and 'B' or 'b' for Bus</i>), and (ii) Number of hours that a vehicle spent in the parking lot. The algorithm should compute the parking charge based on the following parking rates – Rs. 5, Rs.10 and Rs. 50 per hour respectively for motorbike, car and bus.	L3	CO2	7 M
OR					
2	a)	What is software? Explain various types of software.	L2	CO1	7 M
	b)	Draw a flowchart for finding the greatest and smallest number from four numbers given as input. Ex.: input:5,3,15,10 output: greatest =15,smallest=3	L3	CO2	7 M
UNIT-II					
3	a)	Describe various datatypes in C.	L2	CO1	7 M
	b)	Your library need your help. Given the expected and actual return dates for a library book, the C	L3	CO3	7 M

		<p>program calculates the fine (if any). The fee structure is as follows: i) If the book is returned on or before the expected return date, no fine will be charged i.e. fine=0.</p> <p>ii)If the book is returned after the expected return <i>day</i> but still within the same calendar month and year as the expected return date, fine= Rs. (15*number of days late)</p> <p>iii)If the book is returned after the expected return <i>month</i> but still within the same calendar year as the expected return date, fine =Rs. (50* number of months late)</p> <p>iv)If the book is returned after the calendar <i>year</i> in which it was expected, there is a fixed fine of Rs. 1000.</p>			
OR					
4	a)	Write about arithmetic expressions in C.	L2	CO1	7 M
	b)	What is type casting and type conversion? Write a simple C program to demonstrate the above.	L2	CO3	7 M
UNIT-III					
5	a)	Given an array of integers. Find a peak element in it. An array element is peak if it is NOT smaller than its neighbors. For corner elements, we need to consider only one neighbor. For example, for input array {5, 10, 20, 15}, 20 is the only peak element. For input array {10, 20, 15, 2, 23, 90, 67}, there are two peak elements: 20 and 90. Write a program to print all the peak elements in a given array.	L3	CO3	7 M
	b)	You are given with n number of names. Write a program to sort the given names based on their length? Example: Input: Peter, Swaroop, Raj, Anil Output: Raj, Anil, Peter, Swaroop	L3	CO3	7 M
OR					
6	a)	Explain about various string handling functions in C.	L2	CO1	7 M
	b)	The absolute distance between two integers $x1$	L3	CO3	7 M

		and x_2 is given by $ x_2 - x_1 $. Write a program which sorts an array $x[]$ of n integers in ascending order of their absolute distances with a given number z . For example, given $x[] = \{9, 1, 12, 4, 2\}$ and $z = 6$, the sorted array will be $x[] = \{4, 9, 2, 1, 12\}$. Note that 4 is closest to 6, and 12 is farthest from 6, in terms of absolute distances.			
UNIT-IV					
7	a)	Given 3-angles as parameters, Write a function to check whether they form a triangle or not ($A+B+C = 180$). If yes check whether triangle is scalen, equilateral, isocelless or right angled triangle.	L3	CO3	7 M
	b)	Write a function to print the first n numbers of the series 1, 2, 4, 7, 11, ... The series starts with 1 and the difference between two consecutive numbers is 1 initially and increases by 1 then onwards. Also print the sum of these n numbers.	L3	CO3	7 M
OR					
8	a)	Write a function by using call by reference to check whether all digits of that number are different.	L3	CO3	7 M
	b)	In mathematics, a Kaprekar number is a nonnegative integer whose square can be split into two equal parts that add up to the original number again. For instance, 45 is a Kaprekar number, because $45^2 = 2025$ and $20+25 = 45$. Write a function to find all Kaprekar numbers within a given range.	L3	CO4	7 M
UNIT-V					
9	a)	A railway employee is paid 1200/- (rupees) per day for regular 8 hours of work. Any hours over that are paid overtime rate of 100/- per hour. From the employee's gross pay (total pay per month), 2% is deducted for professional tax, 10% for provident fund and 5% for income tax. However, the employee will get 2% (of the gross pay) for	L3	CO4	7 M

		<p>the education of a child. Write a program to create a structure of employee and read data of 'N' employees as follows:</p> <p>i) the number of extra hours (which the employee worked during a month)</p> <p>ii) the number of children the employee has.</p> <p>The program should output the 'N' employees gross pay (total pay earned by the employee by working) and net take-home pay (after deductions and earning for child education). Assume all months have 30 days.</p>																								
	b)	You are given with three text files namely: file1.txt, file2.txt and file3.txt. Write a program to copy the contents of file1 to file2, file2 to file3 and file3 to file1.	L3	CO3	7 M																					
OR																										
10	a)	Write a program to create a <i>structure 'student'</i> with the member variable number, name, marks and branch. Read sixty students details. Then your program should display the names of the students who got more than 60 marks of CSE branch with name 'Aditya'.	L3	CO3	7 M																					
	b)	<p>Two files File1.txt and File2.txt contain sorted lists of integers. Write a program to produce a third file DATA.txt which holds a single sorted, merged list of these two lists.</p> <p>Example:</p> <table style="margin-left: 20px;"> <thead> <tr> <th>File1.txt</th> <th>File2.txt</th> <th>DATA.txt</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>3</td> <td>1</td> </tr> <tr> <td>5</td> <td>6</td> <td>3</td> </tr> <tr> <td>8</td> <td>9</td> <td>5</td> </tr> <tr> <td></td> <td></td> <td>6</td> </tr> <tr> <td></td> <td></td> <td>8</td> </tr> <tr> <td></td> <td></td> <td>9</td> </tr> </tbody> </table>	File1.txt	File2.txt	DATA.txt	1	3	1	5	6	3	8	9	5			6			8			9	L3	CO4	7 M
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