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B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

October 2024 Supplementary Examinations

Programme: B.E.

Semester: I / II

Branch: Common to all Branches

Duration: 3 hrs.

Course Code: 22CS1ESPOP / 22CS2ESPOP

Max Marks: 100

Course: Principles of Programming in C

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

UNIT - I			CO	PO	Marks
Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.	1	a)	CO1	PO1	5
		Identify the valid and invalid identifiers in the list given below: i) a_b_c ii) break iii) 1stnum iv) my-variable v) sum&avg			
		b) Complete the following program to print the output given. <pre>#include<stdio.h> int main() { int num=36, a=12,b=7; double pi=3.14115996536; char code = 'A'; float amount=123.4456; char msg[]="Hello, Welcome to BMSCE"; printf("The number is: __\n",__); printf("PI value is: __\n",__); printf("The amount is: __\n",__); printf("The code is : __\n",__); printf("The message is: __ ,__"); printf("The message is: __ \n",__); printf("a/b is:__ , (__)__"); }</pre> <p>Output: The number is: 36 PI value is: 3.141160e+000 The amount is:123.45 The code is : A The message is: Hello, We The message is: Hello, Wel a/b is: 1.714286</p>	CO1	PO2	7
		c)	CO1	PO2	8
		Show the evaluation the following expressions step by step based on precedence and associativity: a=1, b=2, c=3, d=4 a) $e = (((a+b)/b)-c) *d)+a*d;$ b) $x=100/20<=10-5+100\%10-20==5>=1 !=20$			

UNIT-II															
2	a)	Consider that, a group photo is taken after an event in a company, the participants of the event are made to stand in an equilateral triangle formation so that everyone is visible in the photo. Write a C program, that will print the position of the participants in 10 rows where each participant represented by a ‘*’.	<i>CO3</i>	<i>PO2</i>	5										
	b)	Consider that you are assigned a task to automate the electricity bill, Write a program in C to calculate and print the electricity bill of a given customer. The customer ID, name, and unit consumed by the user should be captured from the keyboard to display the total amount to be paid to the customer. <table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td>Unit</td><td>Charge/unit</td></tr> <tr><td>Upto 199</td><td>@1.20</td></tr> <tr><td>200 and above but less than 400</td><td>@1.50</td></tr> <tr><td>400 and above but less than 600</td><td>@1.80</td></tr> <tr><td>600 and above</td><td>@2.00</td></tr> </table> If bill exceeds Rs. 400 then a surcharge of 15% will be charged and the minimum bill should be of Rs. 100/-	Unit	Charge/unit	Upto 199	@1.20	200 and above but less than 400	@1.50	400 and above but less than 600	@1.80	600 and above	@2.00	<i>CO3</i>	<i>PO2</i>	7
Unit	Charge/unit														
Upto 199	@1.20														
200 and above but less than 400	@1.50														
400 and above but less than 600	@1.80														
600 and above	@2.00														
	c)	a) Write a program in C to display the n terms of a harmonic series and their sum. The series is: $1 + 1/2 + 1/3 + 1/4 + 1/5 \dots 1/n$ terms. Also draw the flowchart to show the program execution. b) Write a program to print the multiplicative table for the given integer.	<i>CO2</i>	<i>PO2</i>	8										
OR															
3	a)	Consider that you are given a four digit number, find the reverse of a number and check if the given number is a palindrome.	<i>CO2</i>	<i>PO2</i>	6										
	b)	Develop a C program to generate Fibonacci series considering $n1=0, n2=1$ upto 10 terms.	<i>CO2</i>	<i>PO1</i>	6										
	c)	Develop a program to calculate tax, given the following conditions using a switch case: <ul style="list-style-type: none"> • If income is less than 1,50,000, then no tax. • If taxable income is in the range 1,50,001-3,00,000, then charge 10% tax. • If taxable income is in the range 3,00,001-5,00,000, then charge 20% tax. • If taxable income is above 5,00,001, then charge 30% tax. 	<i>CO2</i>	<i>PO1</i>	8										
		UNIT - III													
4	a)	Demonstrate the concept of call by value and call by reference to swap two numbers by passing parameters to functions.	<i>CO1</i>	<i>PO2</i>	8										

	b)	Consider that you are given a task of developing a software for a shopping mall. Develop a function to search an item in the list of items based on the item number using binary search. Also write appropriate calling function.	CO3	PO2	7
	c)	Develop a C program to find the transpose of a given matrix.	CO2	PO2	5
		OR			
5	a)	Develop a C program to multiply two matrices by checking the condition if the multiplication is possible.	CO2	PO2	8
	b)	Imagine you have a classroom full of students. You want to organize them into two groups: one for students with even-numbered birthdays and another for students with odd-numbered birthdays. Develop a C program to form these two groups and count the number in each group using array.	CO3	PO2,3	7
	c)	Illustrate function with parameters and return value versus function without parameter and having return value with programming examples for each.	CO2	PO1	5
		UNIT - IV			
6	a)	Consider that you are supposed to store the details of the students in a structure with each student having studentID, Name, USN, DOB and totalmarks. Create a nested structure to store the DOB of the students. Write a C program to store, display and find the average marks of the students.	CO3	PO2	10
	b)	i) Consider that you are playing a game. The team formation is done based on the number of characters in their names. Write a C program to find the length of each name without using built-in function. ii) Given a String “Hello Welcome to BMSCE”, write a C program to count the vowels and consonants in the given string.	CO3	PO2	10
		UNIT - V			
7	a)	Given the following declarations: int a=5; int b=7; int *p=&a; int *q=&b; what is the value of each of the following expressions? a. l=++a; b. m=++(*p); c. n=--(*q); d. o= --b; e. x=*p;	CO2	PO2	5
	b)	Develop a C program to find the factorial of a number using a factorial function and passing the parameter to the function using pointers.	CO3	PO3	5
	c)	Develop a C program to read a file and print the total number of characters, words and lines in a text file.	CO3	PO3	10
