Name: Enrolment No:	**U UPES**

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, May 2019

Programme Name: BTech - ASE-Spz-AV / ADE / GIE / CivilE-Sz-Infra / E&CE / ASE / Mechatronics / GSE / FSE / EL **Semester : II**

Course Name : **Programming for Problem Solving** **Time : 03 hrs**

Course Code : **CSEG 1003** **Max. Marks : 100**

Nos. of page(s) : **2**

Instructions: Answer all the questions.

SECTION A (5 x 4 = 20 Marks)			
S. No.		**Marks**	**CO**
Q 1	Write a C program to print the following pattern-using loop. **1** **12** **123** **1234** **12345**	**5**	**CO2**
Q2	Write a C program to perform the below given matrix operation. $$\begin{bmatrix} 1 & -5 \\ 4 & 2 \end{bmatrix} + \begin{bmatrix} 3 & 2 \\ -2 & 1 \end{bmatrix} = \begin{bmatrix} & \\ & \end{bmatrix}$$	**5**	**CO3**
Q3	Write a menu driven program to perform an operation addition, subtraction and of 2 values entered through user as per user choice.	**5**	**CO2**
Q4	List the difference between array, structure and union in C language	**5**	**CO5**
SECTION B (10 x 4 = 40 Marks)			
Q5	Give the basic structure of C program. Explain the structure with suitable example.	**10**	**CO2**
Q6	a) How strings are represented in C language. Explain any 3 string functions with suitable examples.(6 Marks) b) Write a C program to display the count of vowels present in the user entered string.(4 Marks)	**10**	**CO3**
Q7	a) What is argument and return type in a function? Give an example for demonstrating them.(4 Marks) b) Write a C program which gets a number 'n' as argument, computes and displays the factorial of 'n' using recursion.(6 Marks) **OR** Using pointers perform the following actions, addition, subtraction, multiplication and division of given 2 numbers.	**10**	**CO4**
Q8	a) Explain the dereferencing operator with a suitable diagram.(4 Marks)	**10**	**CO4**

	b) Find out the output assuming address of A as 4001 and B as 6007. (6 Marks)
	int A = 3;
	int B = 4;
	int *P = &A;
	int *Q = &B;
	printf("%d %d\n",A,B);
	printf("%d %d\n",*P,*Q);
	printf("%p %p\n",P,Q);		

SECTION-C(20 x 2 = 40 Marks)			
Q9	a) Discuss the various generations of Computer with its specifications, advantages and disadvantages.(10 Marks) b) Discuss the need of pseudocode in problem solving towards coding. Name any 4 codes with their usage and guidelines followed.(5 Marks) c) Give the pseudocode to find the simple interest for the given P, T, R values.(5 Marks)	**20**	**CO1**
Q10	a) Specify the need of Structure datatype in C language. Give the syntax of defining and declaring a structure in C with example. (10 Marks) b) Write a C program to design a structure 'student_record' to store name, SAPID, enrollment no, date of registration and DOB. The element DOB is defined using another structure 'date' which has the elements like day, month, year. Store the details of a student in the structure and display the data. (10 Marks) **OR** a) State the functions used to open, reads, write and close the file in C language. Give the syntax and explain with examples the arguments associated with each function.(10 Marks) b) Write a C program to get student name, SAPID, Address, program from user and save the student record in a file. (10 Marks)	**20**	**CO5**

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Instructions: Answer all the questions.

SECTION A (5 x 4 = 20 Marks)

S. No.		Marks	CO
Q 1	Perform the following Number Conversions. $(453)_{10} = (\_?\_)_2 = (\_?\_)_8$	5	CO1
Q2	Write a C program to print the following pattern using loop. ********* ******* ***** *** *	5	CO2
Q3	Write a C program to get the string from user, find the length of the string and print it.	5	CO3
Q4	Explain the functions used to open, reads and write the file in C language. Give the syntax and explain with examples the arguments associated with those function with examples.	5	CO5

SECTION B (10 x 4 = 40 Marks)

Q5	a) Discuss the need of flowcharting in problem solving technique. Give any 5 flowchart symbols with their usage and guidelines(6 Marks) b) Draw a flowchart to find the biggest of 3 user given numbers .(4 Marks)	10	CO1

Q6	a) Design an one dimensional array in C to accept 10 numbers from the user, find the sum of all the elements in the array and print it.(6 Marks)
	 b) Analyse the values in the matrix given below and answer the questions. (4 Marks)
	 ¿
	   i. Types of array required
	   ii. Value stores in index [1][0]_____
	   iii. Value stored in index [2][1]
	   iv. Assuming integer occupies 2 bytes, what will be the size of memory allocated to this array.
		10	CO3

Q7	Function main() gets two numbers from the user and calls two functions defined as follows:
	   a. The function "void add(int , int)" adds the input and display the result.
	   b. The function "void sub(int , int)" subtracts the input and display the result.
	 Create a C program for the above specification.
		10	CO4

	OR Create a function to "void check()" which check the given input is odd/even. Call the function from main. Show and explain the function prototype, function call and function definition in your code.		

Q8	a) What is a pointer in C language? Give an example in passing arguments to the functions through pass by reference method. (5 Marks)
	b) Find out the output assuming address of A as 2002 and B as 4005. (5 Marks)
	int A = 3;
	int B = 4;
	int *P = &A;
	int *Q = &B;
	printf("%d %d\n",A,B);
	printf("%d %d\n",*P,*Q);
	printf("%p %p\n",P,Q);
		10	CO4

SECTION-C(20 x 2 = 40 Marks)			
Q9	a) Give the syntax of defining and declaring a union in C with example.(5 Marks) b) State four difference between structure and union in C.(5 Marks) c) Write a C program to define a union 'product' to store the details of the product like product name, price per unit. Get the name and price per unit and display them.(10 marks) **OR** a) Discuss the need of file handling in C language.(5 Marks) b) Write a C program to get store the employee details like employee name, age, Address, salary in a file.(10 Marks) c) Differentiate the various storage classes of C programming language. (5 Marks)	20	CO5
Q10	a) List the various operator available in C language with purpose and examples. (10 Marks) b) A book and stationary store decides to give its customers 10% discount on a purchase greater than 10,000/-. The program should accept the quantity purchased the price of the items and then calculate the amount payable. Further based on the total amount, appropriate discount should be given and final payable amount should be displayed.(10 Marks)	20	CO2