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Code No. : 11217 S N/O

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS), HYDERABAD

Accredited by NAAC with A++ Grade

B.E. I-Semester Supplementary Examinations, August-2023

Programming for Problem Solving

(New: CSE, AIML, EEE, ECE. & IT)

(Old : Common to all branches)

Time: 3 hours

Max. Marks: 60

Note: Answer all questions from Part-A and any FIVE from Part-B

Part-A (10 × 2 = 20 Marks)

Q. No.	Stem of the question	M	L	CO	PO
1.	How is the floating point number -8.75 stored in a computer using IEEE single precision format? Show the steps.	2	2	1	1,2
2.	Differentiate between left shift operator and right shift operator. Give examples.	2	1	1	1,2
3.	What will be the output of the following C code fragment? <pre>#include <stdio.h> void main() { int a = 2, b = 5; switch (a * b - 1) { case 1 : printf("Hello"); case 2 : printf("Hi"); break; case 3: printf("Welcome"); case 4: . . . case 9: case 10: printf("Programming"); break; } }</pre>	2	3	2	1,2
4.	When is a do-while loop statement used in C? Write the syntax of do-while and give an example.	2	1	2	1,2
5.	Consider a scenario where you are given two arrays P and Q of equal length. Each element in P represents a Student's marks in PPS course, and the corresponding element in Q represents the Student's attendance. Write a C function to display mark of students who have attended at least 75% of their classes.	2	3	3	

6.	Sort the following data using bubble sort algorithm and show the working. PPS, BED, IEE, SPOD, BEM	2	2	3	1,2
7.	Write a C function that takes two integer inputs from the user, finds the maximum of the two integers and returns a pointer to the maximum integer.	2	3	4	1,2,3
8.	What is the significance of strcmp() function in C? What is its return value?	2	1	4	1,2
9.	What will be the output of the following C code fragment? #include <stdio.h> enum Month {SUN, MON, TUE=5, WED, THU, FRI, SAT}; void main() { enum Month current_day = WED; enum Month next_day= current_day+ 1; printf("Current Day is %d\n", current_day); printf("Next Day is %d\n", next_day); }	2	3	5	1,2
10.	Write the file functions which are used for random access of files. Part-B (5 × 8 = 40 Marks)	2	1	5	1,2
11. a)	Convert the following into equivalent number systems. Show the conversion steps. i) (125) ₁₀ = (?) ₂ ii) (376) ₈ = (?) ₁₀ iii) (1010111011) ₂ = (?) ₈ iv) (BE5F) ₁₆ = (?) ₂	4	3	1	1,2
b)	Consider a user has purchased 'n' items and each item is associated with a cost. The GST rate for each item is based on the cost range it falls, as described in the below conditions: The GST rate <ul style="list-style-type: none"> for item with a cost less than or equal to 1000 should be 5%, for item with a cost between 1000 and 5000 should be 12%, and for item with a cost greater than 5000 should be 18%. Create a flowchart as described in the above scenario and finally calculate the total cost including GST for all items and display the total cost to the user.	4	3	1	1,2,3
12. a)	What are the different storage classes available in C language? Give examples to explain each type of storage class.	4	1	2	1,2

<p>b) Write a C program to analyze a number 'n' accepted as input from the user and categorize it as perfect, abundant or deficient based on their factors and also display the factors.</p> <p>Note: A perfect number is a positive integer that is equal to the sum of its proper divisors (excluding the number itself). An abundant number is a positive integer that is less than the sum of its proper divisors, and a deficient number is a positive integer that is greater than the sum of its proper divisors.</p> <p>For example, if the user enters 12, the program should display the message "The number 12 is abundant" and list its factors as 1, 2, 3, 4, 6. If the user enters 28, the program should display the message "The number 28 is perfect" and list its factors as 1, 2, 4, 7, 14. If the user enters 15, the program should display the message "The number 15 is deficient" and list its factors as 1, 3, 5.</p>	<p>4 3 2 1,2,3</p>
<p>13. a) Given a list of 'n' random integers as input, write a C program that accepts an integer from the user and searches for it in the given list. If the integer is present in the array, the program should display the index of the first occurrence of the integer. If the integer is not present in the array, the program should display a message saying that the integer is not found in the array.</p>	<p>4 2 3 1,2,3</p>
<p>b) When is a recursive function used? Write a C program which includes a recursive function to find the factorial of a given number.</p>	<p>4 3 3 1,2,3</p>
<p>14. a) What is the purpose of dynamic memory allocation in C? Write the syntax of malloc() and calloc() functions. Write the C statements to allocate memory to 10 integers using malloc() and calloc().</p>	<p>4 2 4 1,2</p>
<p>b) Given a string 's1' accepted as input from the user, write a C Program to copy first 'n' characters of string 's1' to string 's2' using user defined function. For example: If the input string 's1' is "Vasavi College", and n=6, then string 's2' will be "Vasavi".</p>	<p>4 3 4 1,2,3</p>
<p>15. a) What is a structure? How are the members of structure accessed? Explain with the help of an example.</p>	<p>4 1 5 1,2</p>
<p>b) A company "XYZ" sells the products online. Write a program to store and manage product information using structures in C.</p> <p>The program should allow the user to enter and store the following information for each product:</p> <p>Product_ID (an integer) Product_name (a string) Product_price (a float) Product_quantity (an integer)</p> <p>The user should be able to add new products to the database, delete existing products, update the quantity of products in stock and search for products by Product_ID. Additionally, the program should be able to display a report showing all products in the database. The report should include the product_ID, Product_name, Product_price, and Product_quantity in stock for each product.</p>	<p>4 3 5 1,2,3</p>

16. a)	What are the steps to create and run a C program? Explain with the help of a diagram.	4	2	1	1
b)	Given a number accepted as input from the user, write a C program to find the maximum and minimum digit in the given number using user defined functions. For example, if the input number is 4862, Output should be maximum digit = 8 minimum digit = 2	4	3	2	1,2,3
17.	Answer any <i>two</i> of the following:				
a)	Given 2 matrices A and B of size 'm' rows and 'n' columns. Write a program to add the two matrices A and B and store the result in a matrix R.	4	2	3	1,2,3
b)	What is difference between a string and a character array in C? How are they similar? Why is it important to include null character ('\0') in C strings? Write the C statements to initialize a string variable.	4	2	4	1,2
c)	Given two files "file1.txt" and "file2.txt". Write a program that reads the data from "file1.txt" and write the data to file "file2.txt". The input file "file1.txt" contains student name, department and age in the following format: Raj CSE 19 Ravi ECE 19 Ramya IT 20 The program should also display the contents of the file on the monitor.	4	3	5	1,2,3

M : Marks; L: Bloom's Taxonomy Level; CO; Course Outcome; PO: Program Outcome

i)	Blooms Taxonomy Level - 1	20%
ii)	Blooms Taxonomy Level - 2	30%
iii)	Blooms Taxonomy Level - 3 & 4	50%
