Bihar Engineering University, Patna B.Tech. 2nd Semester Special Examination, 2024

Course: B. Tech. Code: 100204

Subject: Programming for Problem Solving

Time: 03 Hours Full Marks: 70

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Instructions:-
(i) The marks are indicated in the right-hand margin.
(ii) There are NINE questions in this paper.
(iii) Attempt FIVE questions in all.
(iv) Question No. 1 is compulsory.
      Choose the correct option / answer of the following (Any seven question only):
                                                                                            [2 \times 7 = 14]
0.1
             What is the return type of the fopen() function in C?
                                                          (ii) A character pointer
             (i) A void pointer
                                                          (iv) An integer pointer
             (iii) Pointer to a file object
       (b) What is the output of the following C code.
             #include<stdio.h>
             int main()
                 int d, a = 1, b = 2;
                 d = a+++++b;
                 printf("%d %d %d", d, a, b);
             }
                                                                                    (iv) 4 3 3
             (i) 324
                                         (ii) 423
                                                              (iii) 3 4 4
             What is void pointer.
       (c)
             Write the names of entry controlled and then exit controlled loops in C.
      (d)
             If ((375)_8 = (y)_{10}, What is the value of y?
      (e)
             What is the output of the following C code.
      (f)
             #include<stdio.h>
             void main()
                double k=0;
                for(k=0.0; k<3.0; k++)
                         printf("%f", k);
                                                                                (iv) None of these
                                                          (iii) 4.000000
                                 (ii) 3.000000
             (i) 2.000000
             How is the 3^{rd} element in an array a is accessed based on pointer notation?
      (g)
                                                                                     (iv) & (a + 3)
                                                          (iii) *(*a + 3)
                                 (ii) *(a + 3)
             (i) *a + 3
            Which one of the following is NOT a Bitwise operator?
      (h)
                                                                                           (iv) <<
                                                           (iii) &&
            (i) ==
                                  (ii) ||
      (i) Language C uses
                                                                                 (iv) Only (i) and (ii)
                                                           (iii) call by name
                                  (ii) call by address
            (i) call by value
      (j) A function may contain
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(i) one return statement

(ii) two return statements

(iv) none of these.

Q.2	(a)	Write a comparative study between for, while and do-while loop.	[5]
	(b)	Write a program in C to find all the prime numbers in the range 10 to 100.	[4]
	(c)	Explain with suitable example, the difference between structure and union.	[5]
Q.3	(a)	Write a C program to read n unsorted integers to an array of size n and pass the array to a function to sort the integers into ascending order using bubble sort technique.	[7]
	(b)	What are the different storage classes in C. Explain each of them in detail.	[7]
Q.4	(a)	List all the shapes used in the flowchart. Draw the flowchart to illustrate the concept of break and continue statements taking suitable examples.	[8]
	(b)	What do you mean by tail recursion. Explain with an example.	[6]
Q.5	(a)	Define a structure <i>Student</i> that consist of the following members: <i>Reg_No</i> , <i>Name</i> , <i>DoB</i> and marks of three subjects. Use nested structure for <i>DoB</i> . Write a C program to input details for 10 students. Also, it should calculate age and average marks obtained by these students as output.	[9]
	(b)	Write a C program to generate Fibonacci series till n^{th} term without using recursion.	[5]
Q.6	(a)	Write a C program that implements string copy function $StrCpy(Str1, Str2)$. This function copies the string $Str1$ to another string $Str2$ without using library functions.	[7]
	(b)	Write a program to read a file and display its contents along with line number before each line.	[7]
Q. 7	(a)	Write a program in C which prints all the digits of a positive integer number entered by user into words. Eg. If 732 is entered through the keyboard, the program should output "seven three two".	[8]
	(b)	How do you access a structure variable through a structure pointer? Explain with example program.	[6]
Q.8	(a)	Write a C program to print the following pattern (till n rows, where n is taken as input)	[8]
		1	
		2 2	
		3 3 3	
		4 4 4 4	
	(b)	Write a complete C program to find out the Trace of a square matrix [Trace means the sum of Principal Diagonal Elements].	[6]
Q.9	Write short notes on any two of the following:		[7x2=14]
	(a)	Pointer Arithmetic Dynamic Memory Allocation	
	(b) (c)	Array of Pointers	
	(d)	Bitwise Shift Operator	