(91) 10/11/23 Set B (6) Nov-23

Scoring Indicators

COURSE NAME: PROGRAMMING IN C

COURSE CODE: 3132 **QID:2110220120**

Q No	Scoring Indicators	Split score	Sub Total	Total score
	PART A			**9**
I. 1	auto	1 mark	1 mark	9 marks
I. 2	recursion	1 mark	1 mark	
I. 3	return	1 mark	1 mark	
I. 4	strlen()	1 mark	1 mark	
I. 5	int x[5]={3,7,2,4,1}	1 mark	1 mark	
1.6	free()			
I. 7	type *ptr_name;	1 mark	1 mark	
I. 8	fread()	1 mark	1 mark	
I. 9	argc stores number of command-line arguments passed by the user including the name of the program.	1 mark	1 mark	
	PART B			24
II. 1	**Advantages of modular programming** ▪ It is easier to read ▪ It is easier to test and debug a long program ▪ Reusability ▪ It is convenient to modify a modular program by modification or replacement of individual modules without disturbing the entire program. ▪ Many programmers can work at the same time on a large program as each individual module.	Any three (1 mark each)	3 marks	3 marks
II. 2	# define,# include,# ifdef,# undef, #ifndef, #else, #elif, ,#endif, #error, #pragma	Any three (1 mark each)	3 Marks	3 marks
II.3	0	3 Marks	3 Marks	3 Marks
II.4	▪ A function is a block of code that performs a specific task. ▪ The key difference between the function prototype and function definition is that the function prototype only contains the declaration of the function while the function definition contains the actual implementation of the function.	Definition- 1 mark Difference-2 marks	1+2= 3 Marks	3 Marks

II.5	A **divide and conquer algorithm** is a strategy of solving a large problem by **Divide**: Divide the given problem into sub-problems using recursion. **Conquer**: Solve the smaller sub-problems recursively. If the sub problem is small enough, then solve it directly. **Combine:** Combine the solutions of the sub-problems that are part of the recursive process to solve the actual problem.	Steps-1 Mark each	3 Marks	3 Marks
II.6	When we pass a pointer as an argument, instead of a variable the address of the variable is passed. So any change made by the function using the pointer is permanently made at the address of passed variable. This technique is known as call by reference. Example:	Explanation with example-3 marks	3 marks	3 marks
II.7	Pointer is a variable that stores the address of another variable. **Advantages:** • Pointer saves the memory space. • Execution time of pointer is faster because of direct access to memory location. • With the help of pointers, the memory is accessed efficiently, i.e., memory is allocated and deallocated dynamically	Definition-1 mark Advantages (any two)-2 marks	1+2=3 Marks	3 marks
II.8	1 2 3 4 5	3 Marks	3 Marks	3 Marks
II.9	• Array and pointers are closely related to each other. In C, the name of an array is considered às a pointer, i.e., the name of an array contains the address of an element. C considers the array name as the address of the first element. • For example, if we create an array, i.e., marks which hold the 20 values of integer type, then marks will contain the address of first element, i.e., marks[0]. • Therefore, we can say that array name (marks) is a pointer which is holding the address of the first element of an array.	Explanation-3 marks	3 Marks	3 Marks
II.10	• The fopen() method in C is a library function that is used to open a file to perform various operations which include reading, writing etc. along with various modes. • fclose() function is a C library function that releases the memory stream opened by the	1 mark each	3 marks	3 marks

	fopen() function. • The functions fread()/fwrite() are used for reading/writing data from/to the file opened by fopen function.			

	PART C			42
III. 1	a) **Formal Parameter:** A variable and its type as they appear in the prototype of the function or method. **Actual Parameter:** The variable or expression corresponding to a formal parameter that appears in the function or method call in the calling environment. b) The scope of an **auto** variable is limited to that block in which we are defining them. The visibility of these variables is also limited to that block in which we are defining them. The initialization of these variables is, by default, a garbage value. The **extern** variable is used for giving a reference of any global variable which is visible to all the files present in a program.	3marks 4 Marks	3+4=7 marks	**7 marks**
	OR			
III. 2	Variable declaration- 1 Marks Logic of the program – 2 marks Using the recursion concept – 3marks Output- 1 mark	1+2+3+1 =7 marks	**7 marks**	**7 marks**
III. 3	a) **One-Dimensional Array** / **Two Dimensional Array** • A one-dimensional array stores a single list of various elements having a similar data type / • A two-dimensional array stores an *array of various arrays,* or a *list of various lists* • It represents multiple data items in the form of a list / • It represents multiple data items in the form of a table that contains columns and rows • It has only one dimension / • It has a total of two dimensions b) Variable declaration & input - 2 Marks Logic-1 mark Output- 1 mark	3 Marks 4 marks	3+4=7 Marks	7 Marks
	OR			
III. 4	Binary Search Algorithm : Input and Variable declarations- 2 Marks Logic of the program – 3 marks Output- 2 mark	2+3+2=7 marks	7 marks	**7 marks**

III. 5	**<u>String manipulation functions:</u>** strcpy(),strcmp(),strlen(),strcmp(),strcat()	List-1 mark Program - 6 marks	1+6=7 marks	**7 marks**
	OR			
III. 6	Input and Variable declarations- 2 Marks Logic of the program – 3 marks Output- 2 mark	2+3+2=7 marks	7 marks	**7 marks**
III. 7	a) Pointers variables are also known as **address data types** because they are used to store the address of another variable. There are only a few operations that are allowed to perform on Pointers. The operations are used for mathematical calculations. The operations are: c) Increment/Decrement of a Pointer d) Addition of integer to a pointer e) Subtraction of integer to a pointer f) Subtracting two pointers of the same type g) Comparison of pointers of the same type. b) <u>Comparision between malloc() and calloc()</u> calloc() 1. calloc() function can assign multiple blocks of memory for a variable. 2. The memory block allocated by a calloc function is always initialized to zero 3. Number of arguments are 2. 4. calloc is slower than malloc. 5. Time efficiency is lower than malloc(). malloc() 1) Malloc() function will create a single block of memory of size specified by the user. 2) Malloc function contains garbage value. 3) Number of argument is 1. 4) Malloc is faster than calloc. 5) Time efficiency is higher than calloc().	Explanation - 3marks Any two difference -4 marks	3+4=7 marks	**7 marks**
III. 8	Input and Variable declarations- 2 Marks Logic of the program – 3 marks Output- 2 mark	2+3+2=7 marks	7 marks	**7 marks**

III. 9	Input and Variable declarations- 2 Marks Logic of the program – 3 marks Output- 2 mark	2+3+2=7 marks	7 marks	**7 marks**

III. 10	a) The whole structure is passed to another function by value. It means the whole structure is passed to another function with all members and their values. So, this structure can be accessed from called function.
	
	returntype functionname(struct tagname argname);
	
	eg. void displayDetail(struct student std);
	
	Here we declaring a function named displayDetail. The return type of this function is set to void . In the list of parameters we have std of struct student type. This means std is a variable of student structure. So, the function displayDetail can take any variable of type student structure as argument.
	
	b) The union is a user-defined data type in C, which stores a collection of different kinds of data, just like a structure. However, with unions, you can only store information in one field at once.
	
	union definition
	
	union unionname
	{
	//member definitions
	};
	union declaration
	When a union is defined, it creates a user-defined type. However, no memory is allocated. To allocate memory for a given union type and work with it, we need to create variables.
	union car
	{
	char name[50];
	int prize;
	}car1,car2;
		4 marks
		
		3 marks
			4+3=7 marks	**7 Marks**

III. 11	a) Input and Variable declarations- 2 Marks Logic of the program – 1 mark Output- 1 mark b) The C library function int feof(FILE *stream) tests the end-of-file indicator for the given stream. a. The C library function int ferror(FILE *stream) tests the error indicator for the	2+1+1=4 marks 3 Marks	4+3=7 marks	**7 marks**

	given stream.			
III. 12	• It is possible to pass some values from the command line to your C programs when they are executed. These values are called command line arguments • The command line arguments are handled using main() function arguments where argc refers to the number of arguments passed, and argv[] is a pointer array which points to each argument passed to the program. • Example	Explantion -3 marks Program-4 marks	3+4=7 marks	7 marks