Total No. of Questions: 6 *Total No. of Printed Pages:3*

Enrollment No.....

Faculty of Engineering

End Sem Examination Dec 2024

CA5CO33 Advanced C Programming

Programme: MCA / BCA-MCA (Integrated) Branch/Specialisation: Computer Application

Duration: 3 Hrs. **Maximum Marks: 60**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d. Assume suitable data if necessary. Notations and symbols have their usual meaning.

			Marks	BL	PO	CO	PSO
Q.1	i.	What is the data type of a function that does not return any value? (a) int (b) float (c) char (d) void	**1**	01	01	01	
	ii.	Which of the following can always be used in the place of recursion? (a) Loops (b) Switch Statements (c) Pointers (d) Arrays	**1**	01	01	01	
	iii.	Which operator is used to access the address of a variable in C? (a) * (b) & (c) % (d) ^	**1**	01	02	02	
	iv.	How do you access the third element of an array "arr" using a pointer "ptr" that points to "arr"? (a) ptr + 3 (b) *(ptr + 2) (c) ptr[2] (d) ptr+2	**1**	01	02	02	
	v.	How do you declare a pointer to a structure in C? (a) struct employee emp_ptr; (b) employee* emp_ptr; (c) pointers struct employee emp_ptr; (d) struct employee*emp_ptr;	**1**	01	01	03	

P.T.O.

vi.	What is an enum in C? (a) A user defined data type that consists of named integer constants (b) A structure with named integer constants (c) A predefined set of values (d) A pointer to a structure	**1**	01	01	03
vii.	To move the file pointer to the end of a file in "rb+" mode, which of the following is correct? (a) fseek(file, 0, SEEK_SET); (b) fseek(file, 0, SEEK_END); (c) fseek(file, -1, SEEK_END); (d) rewind(file);	**1**	01	02	04
viii.	What does the #ifndef directive do in C? (a) Defines a function (b) Declares a function (c) Prevents redefinition of a header file (d) Includes a library file	**1**	01	02	04
ix.	If "typedef int Number;" is defined, what is the meaning of "Number a- (a) A new data type Number is created (b) a is of type int (c) Number id a structure (d) Number is a pointer to int	**1**	01	01	05
x.	If a program runs with the command- ./program arg1 arg2, what does argv[2] contain? (a) ./program (b) arg1 (c) arg2 (d) None, it results in an error	**1**	01	02	05
Q.2 i.	What is recursion and how does it differ from iteration?	**2**	01	01	01
ii.	Explain the process of string input and output in C. What are the different methods of handling strings? Write at least two methods.	**3**	02	01	01
iii.	Write a program that demonstrates the use of a recursive function to calculate the factorial of a number.	**5**	01	03	01

OR	iv.	Explain with the help of a program, how to copy one string in another string using both in-built and user defined functions.	**5**	02	01	01
Q.3	i.	What is a pointer in C? How do you use the &(address) operator with pointers?	**2**	01	01	02
	ii.	Compare call by value and call by reference in terms of memory usage and efficiency. Provide code examples for both.	**8**	04	02	02
OR	iii.	What is dynamic memory allocation? How to use malloc(), calloc() and realloc() functions for dynamic memory allocation?	**8**	01	02	02
Q.4	i.	What is an enumeration (enum) data type in C? How to declare and initialize an enum variable?	**4**	01	01	03
	ii.	Compare structure and unions in terms of memory management, flexibility and performance. Provide examples to illustrate your points.	**6**	04	04	03
OR	iii.	Write a C program to define a structure that stores details about employees (name, ID, and salary). Create a variable of structure and access the members of structure.	**6**	03	04	03
Q.5	i.	Write the execution steps of a C program.	**4**	01	01	04
	ii.	Discuss the purpose and use of preprocessor directives such as #if, #elif, and #define with suitable examples.	**6**	02	01	04
OR	iii.	Which mode is used to open a file for writing? Write a program to write data in a file.	**6**	01	02	04
Q.6		Attempt any two:				
	i.	Explain purpose of self-referential structures in data structures with example.	**5**	02	01	05
	ii.	Describe how command line arguments work in C with examples.	**5**	02	04	05
	iii.	What is typedef in C? Why is it used? Explain with a simple example.	**5**	01	01	05

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Marking Scheme
CA5CO33 (T) Advanced C Programming (T)

Q.1	i)	(d) void	**1**
	ii)	(a) Loops	**1**
	iii)	(b) &	**1**
	iv)	(b) *(ptr+2)	**1**
	v)	(d) struct employee* emp_ptr;	**1**
	vi)	(a) A user defined data type that consists of named integer constants	**1**
	vii)	(b) fseek(file, 0, SEEK_END);	**1**
	viii)	(c) Prevents redefinition of a header file	**1**
	ix)	(b) a is of type int	**1**
	x)	(c) arg2	**1**
Q.2	i.	What is recursion and how does it differ from iteration?	**2**
		Recursion definition -1 mark	
		Difference -1 mark	
	ii.	Explain the process of string input and output in C. What are the different methods of handling strings? write at least two methods.	**3**
		String input out process - 1 mark	
		Methods of handling strings - 1 mark each	
	iii.	Write a program that demonstrates the use of a recursive function to calculate the factorial of a number – 1 marks for output	**5**
OR	iv.	Explain with the help of a program, how to copy one string in another string using both in-built and user defined functions.	**5**
		Using inbuilt function -2 marks	
		Using user defined functions -3 marks	
Q.3	i.	What is a pointer in C? How do you use the &(address) operator with pointers?	**2**
		Pointers Definition -1 mark	
		Use of & operator -1 mark	
	ii.	Compare call by value and call by reference in terms of memory usage and efficiency. Provide code examples for both.	**8**
		Comparison (Each comparison - 1 mark) - 4 marks	
		Program call by value -2 marks	
		Program call by Reference -2 marks	
OR	iii.	What is dynamic memory allocation? How to use malloc(), calloc() and realloc() functions for dynamic memory allocation?	**8**
		Description of dynamic memory allocation -2 marks	
		Use of malloc() function -2 marks	
		Use of calloc() function -2 marks	
		Use of realloc() function -2 marks	
Q.4	i.	What is an enumeration (enum) in C? How to declare and initialize enum?	**4**
		Definition -2 marks	
		Declaration and initialization -2 marks	
	ii.	Compare structure and unions in terms of memory management, flexibility and performance. Provide examples to illustrate your points.	**6**
		Comparison:	
		Memory management -2 marks	
		Flexibility -1 mark	
		Performance -1 mark	
		Examples -2 marks	
OR	iii.	Write a C program to define a structure that stores details about employees (name, ID, and salary). Create a variable of structure and access the members of structure.	**6**
		Structure -2 marks	
		variable of structure -1 mark	
		Accessing members of structure -2 marks	
		-1 mark for output	
Q.5	i.	Write the execution steps of a C program.	**4**
		Each step -1 mark	
	ii.	Discuss the purpose and use of preprocessor directives such as #if, #elif, and #endif with suitable examples.	**6**
		#if - 2 marks	
		#elif - 2 marks	
		#define - 2 marks	
OR	iii.	Which mode is used to open a file for writing. Write a program to write data in a file.	**6**
		Mode is used to open file for writing -1 mark	

Program to write in a file -5 marks

Q.6 Attempt any two:

i. Explain purpose of self referential structures in data structures with example. **5**

Explanation -2 marks

Example -3 marks

ii. Describe how command line arguments work in C with examples. **5**

Description -2 marks

Example -3 marks

iii. What is typedef in C, and why is it used? Explain with a simple example. **5**

Definition -1 mark

Purpose -1 mark

Example -3 marks

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