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RV COLLEGE OF ENGINEERING®

(An Autonomous Institution affiliated to VTU)

1 / II Semester B. E. Examinations October-2023

Common to all programs

FUNDAMENTALS OF PROGRAMMING USING C (ELECTIVE)

Time: 03 Hours ***Maximum Marks: 100***

Instructions to candidates:

1. Answer all questions from Part A. Part A questions should be answered in first three pages of the answer book only.
2. Answer FIVE full questions from Part B. In Part B question number 2 is compulsory. Answer any one full question from 3 and 4, 5 and 6, 7 and 8 & 9 and 10.

PART-A

1	1.1	Software that loads and starts the Operating System is called as _____.	01
	1.2	Write an algorithm to swap the two numbers without using third variable.	02
	1.3	In software development, what is the role of requirement analysis?	01
	1.4	The statement $printf(\text{“}the\ number\ is\text{: }\%d\text{”}, 3272);$ prints 3272 as an output. Now modify the statement to print the same *number* (3272) as 00003272.	01
	1.5	Name the datatype of the following values: $12.33, 6698888686888858,\ 'g'$	01
	1.6	Write a C program to print biggest among the three numbers x, y and z using ternary operator.	02

	1.7	The output of the following program is _____.
		$\#include < stdio.h >$
		$int\ main\ ( )$
		{
		$int\ i, j;$
		$for(i = 0, j = 4; i < 4, j > 0; i++, j--);$
		{
		$printf(\text{“}\backslash n\%d\backslash t\%d\text{”}, i, j);$
		}
		}
			02

	1.8	What is the output of the following program?
		$\#include < stdio.h >$
		$int\ main\ ( )$
		{
		$char\ mystring[2][3] = \{\{'B','i','o'\},\{\ 't',' c','h'\}\};$
		$printf(\text{“}\%c\text{”}, --mystring[1][2]);$
		}
			01

1.9	Justify the statement "In the following program the value of 'i' will never become more than zero".
	`int main ( )`
	`{`
	`int i, j;`
	`for(i = 0; i < 4; i++)`
	`{`
	`if(i > 2)`
	`break;`
	`return 0;`
	`}`
	`}`
		01

1.10	_____ is the output of the following program.
	`#include < stdio.h >`
	`int main ( )`
	`{`
	`char mystring [20] = "Biotech";`
	`int i;`
	`for (i = 0; mystring[i]! = '\0'; i++)`
	`mystring[i] >= 97 && mystring[i] <= 122 ?`
	`printf("\t%c", mystring[i] − 32 : printf ("\t %c", mystring[i] + 32);`
	`}`
		02

1.11	At the time of function call, if you pass the arguments in the form of variables or direct values to the function, then it is called as _____.	01
1.12	Show how you compute length of given string using library function.	01

1.13	What is the output of the following program?
	`#include < stdio.h >`
	`struct numbers {`
	`int i;`
	`float j;  };`
	`int main ( )`
	`{`
	`struct members val = {2, 2.5};`
	`printf("\n %d  %f ", val.i, val.j);`
	`}`
		02

1.14	Identify the line numbers containing errors in the following program.
	`#include < stdio.h >`
	`int main ( )`
	`{`
	`int arr[] = {1, 2, 3, 4, 5, 6, 7, 8, 9};`
	`int *ptr1 = &arr[0], *ptr2 = arr;`
	`while(ptr1 <= ptr2)`
	`{`
	`printf("%d", *ptr1);`
	`*ptr++;`
	`}`
	`}`
		01

1.15	In the following code, how many pointers are pointing to the first element of an array ***arr*** ?
	`#include < stdio.h >`
	`int main ( )`
	`{`
	`int arr[] = {1, 2, 3, 4, 5, 6, 7, 8, 9};`
	`int *ptr1 = &arr[0], *ptr2 = arr, *ptr3 = &arr[*ptr1], *ptr4 = ptr3;`
	`}`
		01

PART-B

2	a	Explain the following in brief: i) Control Unit (CU) ii) Arithmetic and Logic Unit (ALU) iii) Memory Unit (Registers).	08
	b	Write an algorithm and flowchart to compute sum of an array of numbers.	08
3	a	Starting from creation of C program to till execution of it, every C program is associated with four different kinds of files. Explain in brief what these files are.	08
	b	What are the rules to be followed while naming the variable or any identifier?	03
	c	Explain Type conversion and Type casting with simple example for each.	05
		OR	
4	a	Name the different types of operators and illustrate the usage of bitwise operators with simple example for each.	06
	b	Explain any two flags, length modifiers and type specifies used with $printf()$ statement.	04
	c	Write a C program to calculate distance between two points. $[distance\ between\ two\ points = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}\ ]$	06
5	a	Write a C program to print the multiplication table of 1 to 10 in the following form. $1X1 = 1$ …… $10X1 = 10$ . . . . $1X10 = 10$ …… $10X10 = 100$	08
	b	Write a C program to insert a number at a given location in an array.	08
		OR	
6	a	Classify the looping statements and illustrate any two of them with simple example each.	08
	b	Write a C program to read $2D$ matrix of 4×4, transpose the same after reading and also print the transposed matrix.	08
7	a	Write a C program to perform the following operations on the string: i) Reversing a string ii) Extracting first N characters of the string.	08
	b	Briefly describe all the basic function designs used in writing user defined functions.	08
		OR	
8	a	Write a C program to read two $m \times n$ matrices, calculate the sum of the two matrices and store the result in another $m \times n$ matrix using functions.	08

	b	Illustrate the usage of the following string functions with simple example C program: i) $strcat()$ ii) $strcmp()$ iii) $strcpy()$ iv) $strncpy()$ v) $strchr()$	08
9	a	Write the C functions to perform the following and implement these functions by keeping in mind that you are going to call these functions by reference. i) Calculate factorial of the number n. ii) Calculate n Fibonacci numbers.	08
	b	What is an array of structures? Write a C program to read and display the information of all the students in the class.	08
		OR	
10	a	Develop a C program using structures to compute average marks of $'n'$ students $(Name, Roll\_No, Test\ Marks)$ and search a particular record based on $'Roll\_No'$.	10
	b	What are the advantages and disadvantages of using a pointer? Demonstrate how you declare, initialize and dereference the pointer with your own example.	06