Reg. No. ☐☐☐☐☐☐☐☐☐☐☐☐☐

B.E / B.TECH. DEGREE EXAMINATIONS, MAY 2023

First/Second Semester

IT18101 – PROGRAMMING FOR PROBLEM SOLVING

(Common to all branches except MR)

(Regulation 2018 / Regulation 2018A)

TIME: 3 HOURS   MAX. MARKS: 100

CO	Outcome	RBT
CO 1	Apply various problem solving techniques and represent solutions to problems in the form of algorithms and flow charts.	3
CO 2	Examine given problems, design solutions and write C programs using the constructs of C language.	4
CO 3	Apply the advanced constructs and string manipulation feature available in C programming language to solve problems.	3
CO 4	Demonstrate the use functions, structures and unions to create modularized applications in C language.	4
CO 5	Illustrate the dynamics of memory by the use of files and pointers.	3

PART- A (10 x 2 = 20 Marks)

(Answer all Questions)

		CO	RBT LEVEL
1.	Compare compiler and interpreter. Give an example for each.	1	2
2.	What type of computer is suitable to meet the personal needs of an individual? Give examples.	1	2
3.	Mention any two scenarios where do-while loop is preferred over for and while loop constructs.	2	2
4.	Categorize the keywords and non-keywords in the following: `int, main, goto, printf, while, scanf, else, include`	2	2
5.	Given the array declaration `int arr[6] = {8,2,4,6,8,10};` what is the value of `arr[arr[2]]`?	3	3
6.	What is the output of the below program?	3	3

```
#include<stdio.h>
void main ()
{
    char arr[5];
    int i;
    for(i=0;i<5;i++)
    printf("%c",arr[i]);
}
```

7.	Given that integer takes 4 bytes, float takes 4 bytes and character takes 1 byte of memory, how much memory a variable of the below structure will occupy?	4	3

```
struct test{
int age;
char gender;
float cgpa;
};
```

8.	When a function prototype is necessary in a C program? Give an example.	4	2
9.	Why an unassigned pointer should not be used? Explain with an example.	5	2
10.	Why macros should be defined at the beginning of the program?	5	2

PART- B (5 x 14 = 70 Marks)

		Marks	CO	RBT LEVEL
11. (a)	Discuss the hardware components and their connections in a computer with suitable diagrams.	(14)	1	2
	(OR)			
(b)	Elucidate the types of network topologies with necessary diagrams.	(14)	1	2
12. (a) (i)	You are given with a number from 1 to 7. Write a C program to print the respective day of the week starting from Sunday.	(7)	2	3
(ii)	Write a C program to check if a character is a vowel, consonant, or a number.	(7)	2	3
	(OR)			
(b) (i)	Write a C program to print the prime numbers from 1 to 100.	(7)	2	3
(ii)	Write a C program to evaluate the series 1+2+3+... up to N terms using `for` and `while` loop constructs.	(7)	2	3
13. (a) (i)	Write a C program to find the average marks scored by N students of a class for one subject. Remember, the marks can be in decimal values.	(7)	3	3
(ii)	Write a C program to find the sum and difference of two M × N matrices.	(7)	3	3
	(OR)			

(b)	(i)	Write a C program to convert the characters (lower-case to upper-case and vice-versa) in a given name. The ASCII values of 'A' and 'a' are 65 and 99 respectively.	(7)	3	3
	(ii)	Write a C program to count the number of spaces in a given string without using string library functions.	(7)	3	3

14. (a)	(i)	Demonstrate the concept of pass-by-value and pass-by-address using a C program of your choice.	(7)	4	3
	(ii)	Write a C program using recursive function to calculate the factorial of a number.	(7)	4	3

(OR)

(b)	Demonstrate the concept of reading and displaying an array of structure by creating an array of a book structure with book id, price, author, ISBN as elements.	(14)	4	3

15. (a)	(i)	Write a C program to perform addition, subtraction, and multiplication of two numbers using pointers.	(7)	5	3
	(ii)	Write a C program to demonstrate the concept of double pointers.	(7)	5	3

(OR)

(b)	Write a C program to demonstrate all file operations.	(14)	5	3

PART- C (1 x 10 = 10 Marks)

(Q.No.16 is compulsory)

		Marks	**CO**	**RBT LEVEL**
16.	ABC company announces 5% bonus to its employees who earn more than 5000 per month; 3% bonus to those earn between 3000 and 5000; and a fixed bonus of Rs 500 to others. The salary of an employee cannot be negative. Design an application to ABC to calculate the revised salary of its employees.	(10)	2	4

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