INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad - 500 043

COMPUTER SCIENCE AND ENGINEERING

TUTORIAL QUESTION BANK

Course Title	**PROGRAMMING FOR PROBLEM SOLVING**				
Course Code	ACSB01				
Programme	B.Tech				
Semester	I	AE | ME			
	II	CSE | IT | ECE |EEE			
Course Type	Foundation				
Regulation	IARE - R18				
Course Structure	Theory			Practical	
	Lectures	Tutorials	Credits	Laboratory	Credits
	3	0	3	4	2
Chief Coordinator	Mr. P Ravinder, Assistant Professor				
Course Faculty	Dr. J Sirisha Devi, Associate Professor, CSE Dept Dr. R ObulaKonda Reddy Associate Professor , CSE Dept Mrs. K Laxmi Narayanamma, Assistant Professor, IT Dept. Mrs. B Padmaja Assistant Professor, CSE Dept Dr. M Purushotham Reddy, IT Dept Mr. Ch Suresh Kumar Raju Assistant Professor, CSE Dept.				

COURSE OBJECTIVES:

The course should enable the students to:

I.	Learn adequate knowledge by problem solving techniques.
II.	Understand programming skills using the fundamentals and basics of C Language.
III.	Improve problem solving skills using arrays, strings, and functions.
IV.	Understand the dynamics of memory by pointers.
V.	Study files creation process with access permissions.

COURSE OUTCOMES (COs):

CO 1	Describe the concept of computer system, analyze a given problem, develop an algorithm, fundamental programming constructs, identify data representation formats, and describe operators and their precedence, associativity.
CO 2	Understand decision making control statements and loop control statements.
CO 3	Describe the concept of homogeneous derives data types, strings and functions.
CO 4	Understand pointers and heterogeneous data types and its necessity.
CO 5	Describe the concept of file system, file system modes and functions.

COURSE LEARNING OUTCOMES (CLOs):

Students, who complete the course, will have demonstrated the ability to do the following:

ACSB01.01	Identify and understand the working of key components of a computer system.
ACSB01.02	Analyze a given problem and develop an algorithm to solve the problem.
ACSB01.03	Describe the fundamental programming constructs and articulate how they are used to develop a program with a desired runtime execution flow.
ACSB01.04	Gain knowledge to identify appropriate C language constructs to write basic programs.
ACSB01.05	Identify the right data representation formats based on the requirements of the problem.
ACSB01.06	Describe the operators, their precedence and associativity while evaluating expressions in program statements.
ACSB01.07	Understand branching statements, loop statements and use them in problem solving.
ACSB01.08	Learn homogenous derived data types and use them to solve statistical problems.
ACSB01.09	Identify the right string function to write string programs.
ACSB01.10	Understand procedural oriented programming using functions.
ACSB01.11	Understand how recursion works and write programs using recursion to solve problems.
ACSB01.12	Differentiate call by value and call by reference parameter passing mechanisms.
ACSB01.13	Understand storage classes and preprocessor directives for programming
ACSB01.14	Understand pointers conceptually and apply them in C programs.
ACSB01.15	Distinguish homogenous and heterogeneous data types and apply them in solving data processing applications.
ACSB01.16	Explain the concept of file system for handling data storage and apply it for solving problems
ACSB01.17	Differentiate text files and binary files and write the simple C programs using file handling functions.
ACSB01.18	Identify the right string function to write string programs.
ACSB01.19	Understand procedural oriented programming using functions.
ACSB01.20	Understand how recursion works and write programs using recursion to solve problems.

TUTORIAL QUESTION BANK

MODULE - I				
INTRODUCTION				
Part - A (Short Answer Questions)				
S No	**Questions**	**Blooms Taxonomy Level**	**Course Outcomes**	**Course Learning Outcomes (CLOs)**
1	List the two major components of a computer system?	Remember	CO 1	ACSB01.01
2	Identify the steps in creating and running a C program?	Remember	CO 1	ACSB01.03
3	What are the different types of computing environments?	Remember	CO 1	ACSB01.02
4	Define a flowchart and the symbols used in it?	Understand	CO 1	ACSB01.03
5	State the properties of an algorithm?	Remember	CO 1	ACSB01.02
6	List out the generations of computers?	Understand	CO 1	ACSB01.02
7	What are the different types of computer programming languages?	Understand	CO 1	ACSB01.02
8	Write the various classes of data types ANSI C supports?	Remember	CO 1	ACSB01.05
9	State which of the following are valid identifiers. If invalid, state the reason. 1. sample1 2. data_7 return 3. #fine 91-080-100 4. name &age 5. _val	Understand	CO 1	ACSB01.05
10	What are the C tokens?	Remember	CO 1	ACSB01.05
11	List out the rules for identifiers?	Remember	CO 1	ACSB01.05
12	What is type casting and list its types?	Understand	CO 1	ACSB01.05
13	Write the basic structure of a C program?	Understand	CO 1	ACSB01.05
14	Define ternary or conditional operator with an example?	Understand	CO 1	ACSB01.06
15	Find the value of x in the following expression? x = 3 / 2 % 6 – 3 / 9;	Understand	CO 1	ACSB01.06
16	List out the bit-wise operators in C?	Understand	CO 1	ACSB01.05
17	Write the size and range of the fundamental data types?	Remember	CO 1	ACSB01.05
18	Explain the various key words related to data types and loops?	Remember	CO 1	ACSB01.04
19	List out logical operators used in C language?	Understand	CO 1	ACSB01.06
20	Write the basic escape sequence characters and its meaning with example?	Remember	CO 1	ACSB01.06
Part - B (Long Answer Questions)				
1	Explain the fundamental data types along with its size and range?	Understand	CO 1	ACSB01.03
2	Explain bit-wise operators with example?	Understand	CO 1	ACSB01.05
3	Explain the following functions with example? i. getc() ii. putc() iii. gets() iv. puts()	Understand	CO 1	ACSB01.06
4	Explain the salient features and applications of C language?	Understand	CO 1	ACSB01.05
5	Explain the modifiers used for data types in C language?	Understand	CO 1	ACSB01.06
6	Explain type conversions in C with example?	Understand	CO 1	ACSB01.06
7	Find the output of the following expression step by step by mentioning operator precedence and associativity in each step 17 – 8 / 4 * 2 + 3 - ++5	Remember	CO 1	ACSB01.05
8	Write a C program to find the size of primary data types using size of operator?	Understand	CO 1	ACSB01.06
9	Write a C program to calculate the area of a sphere where $A = 4\pi r^2$ by taking radius as input from the user?	Understand	CO 1	ACSB01.04

10	Write a C program to read the temperature in Fahrenheit and convert it Into Celsius by using the formula C = (F − 32) × 5/9	Understand	CO 1	ACSB01.06
11	Explain the special operators in C with example?	Understand	CO 1	ACSB01.05
12	Write a C program to find the area of a Circle and also draw a flowchart for it?	Understand	CO 1	ACSB01.04
13	Write a C program to swap two numbers with and without using a third variable?	Understand	CO 1	ACSB01.06
14	Write a C program to calculate the sum of N natural numbers without using a loop?	Understand	CO 1	ACSB01.05
15	Draw a flowchart to find the factorial of a given number?	Understand	CO 1	ACSB01.06
16	Write a C program to find the volume of a Cone by reading the inputs radius and height from the user where $V = \pi r^2 (h/3)$	Understand	CO 1	ACSB01.05
17	The price of one kg of Rice is Rs. 40.75 and one kg of Dal is Rs. 72.50. Write a C program to get these values from the user and display the prices as follows: **** LIST OF ITEMS **** *** Item Price *** Rice Rs 40.75 Sugar Rs 72.50	Understand	CO 1	ACSB01.04
18	Explain the various operators used in c programming and exemplify the use of ternary operator	Understand	CO 1	ACSB01.04
19	Distance between two points (x1, y1) and (x2, y2) is governed by the formula D2 = (x2 – x1)2 + (y2 – y1)2 Write a C program to compute D given the coordinates of the points.	Understand	CO 1	ACSB01.04
20	The total distance travelled by a vehicle in t seconds is given by distance = ut+ (at2)/2 Where u is the initial velocity (meters per second), a is the acceleration (meters per second). Write a C program to calculate the distance travelled, given the values of u and a.	Understand	CO 1	ACSB01.04
	Part - C (Problem Solving and Critical Thinking Questions)			
1	What does the following statement do, justify your answer? x = x |1 << n; i. Sets x as 2^n ii. Sets $(n+1)^{th}$bit ofx iii. Toggles $(n+1)^{th}$bit ofx iv. Unsets $(n+1)^{th}$bit ofx	Understand	CO 1	ACSB01.05

2	#include
	<stdio.h>
	int
	main(voi
	d)
	{
	int a = 1; int b = 0;
	b = a++ + a++; printf("%d %d",a,b); return 0;
	}
	i. 36
	ii. Compiler Dependent
	iii. 3 4
	iv. 3 3
		Understand	CO 1	ACSB01.05

3	What is the output of following program?
	int main()
	{
	int a = 1; int b = 1;
	int c = a || --b;
	int d = a-- && --b;
	printf("a = %d, b = %d, c = %d, d = %d", a,
	b, c, d); return 0;
	}
		Understand	CO 1	ACSB01.05

4	Predict the output of the below program:
	int main()
	{
	printf("%d", 1 << 2 + 3 << 4);
	return 0;
	}
		Understand	CO 1	ACSB01.06

5	Predict the output of following program?
	int main()
	{
	int x = 10; int y = 20;
	x += y += 10;
	printf (" %d
	%d", x, y);
	return 0;
	}
		Understand	CO 1	ACSB01.06

6	Predict the output of following program?
	int main()
	{
	int a = 0; int b;
	a = (a == (a == 1));
	printf(
	"%d",
	a);
	return
	0;
	}
		Understand	CO 1	ACSB01.05

7	Predict the output of following program?
	int main()
	{
	int y = 0;
	int x = (~y == 1); printf("%d", x);
	return 0;
	}
		Understand	CO 1	ACSB01.06

8	Predict the output of following program?
	int main()
	{
	int a = 2,b = 5; a =a^b;
	b =b^a;
	printf("%d
	%d",a,b);
	return0;
	}
		Understand	CO 1	ACSB01.06

9	What is the output of the program? int main() {int x = 10, y = 20, z = 5, i; i = x < y < z; printf("%d\n", i); return 0;	Understand	CO 1	ACSB01.06

10	What is the output of the program
	int main()
	{
	int X=40;
	{
	int X=20;
	printf("%d ", X);
	}printf("% d\n", X);
	Return 0;
	}
		Understand	CO 1	ACSB01.04

MODULE - II				
CONTROL STRUCTURES				
Part - A (Short Answer Questions)				
1	What is a control structure? List out their types.	Understand	CO 2	ACSB01.07
2	Write a C program to check whether number is Prime or Not	Understand	CO 2	ACSB01.07
3	What is the difference between while loop and do-while loop	Understand	CO 2	ACSB01.07
4	Write a C program to check whether a number is positive or negative.	Understand	CO 2	ACSB01.07

5	Find the output of the following code?
	int main()
	{
	int i = 1;
	for(; i< 4; i++);
	printf("%d", i); return 0;
	}
		Understand	CO 2	ACSB01.07

6	What is nested for and write the syntax of nested for loop.	Understand	CO 2	ACSB01.07

7	Find the output of the following code?
	int main()
	{
	int a;
	for(a = 5; --a;)
	printf("\n%d", a); return 0;
	}
		Understand	CO 2	ACSB01.07

8	State the difference between entry controlled and exit controlled loop with example?	Remember	CO 2	ACSB01.07
9	Write the usage of break and continue statement with example?	Remember	CO 2	ACSB01.07

10	Find the output of the following code?
	int main()
	{
	int a = 1, b = 2, c = 3, d =
	4, e; if(e= (a & b | c ^ d))
	printf("%d", e); return 0;
	}
		Understand	CO 2	ACSB01.07

11	Find the output of the following code?
	int main()
	{
	int a=1,b=2,c=3,d=4; if (d > c)
	if (c > b)
	printf("%d %d", d, c); else if (c > a)
	printf("%d %d", c, d);
	if (c > a)
	if (b < a)
	printf("%d %d", c, a); else if (b < c)
	printf("%d %d", b, c);
	}
		Understand	CO 2	ACSB01.07

12	Find the output of the following code?
	void main()
	{
	int choice = 3;
	switch(choice)
	{
	default: printf("default");
		Understand	CO 2	ACSB01.07

	case 1: printf("choice 1");break;
	case 2: printf("choice 2");break;
	}
	}			

13	Find the output of the following code?
	void main()
	{
	char c = 125; do
	printf("\n%d", c); while(c++);
	}
		Understand	CO 2	ACSB01.07

14	Find the output of the following code?
	void main()
	{
	for(;;)
	{
	printf("%d", 10);
	}
	}
		Understand	CO 2	ACSB01.07

15	Find the output of the following code?
	void main()
	{
	printf("hi!"); if (!0)
	printf("bye");
	}
		Understand	CO 2	ACSB01.07

16	Find the output of the following code?
	void main()
	{
	int a =1; if(a)
	printf("test"); else ; printf("again");
	}
		Understand	CO 2	ACSB01.07

17	Find the output of the following code?
	void main()
	{
	int i =1;
	if(i++, ++i, i--, --i)
	printf("%d\n", i);
	}
		Understand	CO 2	ACSB01.07

18	Find the output of the following code?
	void main()
	{
	float i;
	for(i = 0.1;i < 0.4; i += 0.1)
	printf("%.1f\n", i);
	}
		Understand	CO 2	ACSB01.07

19	Explain with example switch case execution process with and without break statement?	Understand	CO 2	ACSB01.07

20	Find the output of the following code?
	void main()
	{
	int i = 3;
	for(i--; i< 7; i = 7)
	printf("%d", i++);
	}
		Understand	CO 2	ACSB01.07

Part - B (Long Answer Questions)				
1	Compare and Contrast while and do while loop? Write a C program to print the odd numbers from X to Y using do while loop?	Remember	CO 2	ACSB01.07
2	An electric power distribution company charges domestic consumers as follows:	Understand	CO 2	ACSB01.07

	Consumption Units Rate ofcharge 0-20 Rs 0.50 perunit 201-400 Rs 100 + Rs0.65 per unit excessof200 401-600 Rs 230 plus 0.80 per unit excessof400 601andabove Rs 390 plus Rs 1.00 per unit excess of600 Write a C program that reads the customer number and power consumed and print amount to be paid by the customer (Use else-if ladder)			
3	Write a C program to display the traffic control signal lights based on the following. i. If user entered character is R or r then print RED Light Please STOP. ii. If user entered character is Y or y then print YELLOW Light Please Check and Go. iii. If user entered character is G or g then print GREEN Light Please GO. iv. If user entered some other character then print THERE IS NOSIGNAL POINT.	Understand	CO 2	ACSB01.07
4	Admission to a professional course is subject to the following conditions: i. Marks in Mathematics >=60 ii. Marks in Physics >= 50 Marks in Chemistry >=40 iii. Total in all three subjects >=200 iv. Total in Mathematics and Physics >=150 Given the marks in the three subjects, Write a C program to process the application to list the eligible candidates.	Understand	CO 2	ACSB01.07
5	Write a C program to compute the real roots of a quadratic equation $ax^2 + bx + c = 0$. The program should request for the values of the constants a, b and c and print the values of x1 and x2. Use the following rules: i. No solution, if both a and b are zero There is only one root, ifa=0 ii. There are no real roots, if b2 - 4ac is negative Otherwise, there are two real roots Write a C program to test all the above conditions.	Understand	CO 2	ACSB01.07
6	Write a program that counts from one to ten, prints the values on a separate line for each, and includes a message of your choice when the count is 3 and a different message when the count is 7.	Understand	CO 2	ACSB01.07
7	Write a C program to calculate commission for the input value of sales amount. Commission is calculated as per the following rules: i. Commission is nil for sales amount Rs5000/. ii. Commission is 2% for sales when sales amount is greater than 5000and less than equal to10000. iii. Commission is 5% for sales amount greater than10000.	Understand	CO 2	ACSB01.07
8	A character is entered through keyboard. Write a C program to determine whether the character entered is a capital letter, a small case letter, a digit or a special symbol using if-else and switch case. The following table shows the range of ASCII values for various characters. **Characters ASC** II values A–Z 65 –90 a–z 97 –122 0–9 48 – 57 Special symbols 0 – 47, 58 – 64, 91 – 96, 123 -127	Understand	CO 2	ACSB01.07

9	If cost price and selling price of an item S input through the keyboard, write a program to determine whether the seller has made profit or incurred loss. Write a C program to determine how much profit or loss incurred in percentage.	Understand	CO 2	ACSB01.07
10	Write a C program to produce the following output? 1 3 5 7 9 11 13 15 17 19	Understand	CO 2	ACSB01.07
11	Write a C program for the following: i. To print the reverse of an integer number ii. To check whether the given integer is palindrome or not.	Understand	CO 2	ACSB01.07
12	Write a C program to print the numbers in triangular form. 1 1 2 1 2 3 1 2 3 4 1 2 3 4 5	Understand	CO 2	ACSB01.07
13	Write a C program to read in two numbers, x and n, and then compute the sum of this geometric progression $1+x+x^2+x^3+...x^n$. For example: if n is 3 and x is 5, then the program computes 1+5+25+125. Print x, n, the sum. Perform error checking. For example the formula does not make sense for negative Exponents – if n is less than 0. Have your program print an error message if n<0,then go back and read in then pair of numbers of without computing the sum. Are any values of x also illegal? If so, test for them too.	Understand	CO 2	ACSB01.07
14	Write a C program to print Armstrong numbers between 1 to n where n value is entered by the user. [Hint: Armstrong number is defined as the sum of cubes of individual digits of a number. e.g. 371 = 33 + 73 + 13]	Understand	CO 2	ACSB01.07
15	Write a C program to generate all prime numbers between 1 and n, where n value is supplied by the user.	Understand	CO 2	ACSB01.07
16	Write a C program to print first n lines of the Pascal"s Triangle.Pascal"s triangle is a triangular array of the binomial coefficients. 1 1 1 1 2 1 1 3 3 1	Understand	CO 2	ACSB01.07
17	Write a C program to print first n lines of Floyd"s Triangle. 1 2 3 4 5 6 7 8 9 10	Understand	CO 2	ACSB01.07
18	Write a C program to print the following series 1/1! + 2/2! + 3/3! + ……	Understand	CO 2	ACSB01.07
19	Write a C program to compute and display the sum of all integers that are divisible by 6 but not divisible by 4 and lie between 0 and 100. The program should also count and display the number of such values.	Understand	CO 2	ACSB01.07
20	Write a C program to find the LCM and GCD of two integers?	Understand	CO 2	ACSB01.07
Part - C (Problem Solving and Critical Thinking Questions)				

1	Predict the output of the following?
	int main()
	{
	int i = 1024;
	for (; i; i >>= 1)
		Understand	CO 2	ACSB01.07

	printf("IARE");
	return 0;
	}			

2	Find the final value of i, j, k from the code?
	void main()
	{
	int i = 5, j = 10, k = 1; if(++i || ++j)
	k = i + j;
	else
	k = i - j; printf("%3d%3d%3d", i, j, k);
	}
		Understand	CO 2	ACSB01.07

3	Predict the output of the following?
	void main()
	{
	int i, j, k;
	for(i = 1;i < 3; i++)
	{
	for(j = 1; j < 3; j++)
	{
	for(k = 1; k < 3; k++)
	{
	if(j == k) break; else
	{
	printf("%d\t%d\t%d\n", i,j, k);
	continue;
	}
	}
	}
	}
	}
		Understand	CO 2	ACSB01.07

4	Find the error from the code given below:
	int main()
	{
	char check = 'a';
	switch(check)
	{
	case 'a' || 1: printf("IARE"); case 'b' || 2:
	printf("IIT");break; default:printf("IARE-IIT");
	}
	return 0;
	}
		Understand	CO 2	ACSB01.07

5	Predict how many times IARE will be printed:
	int main()
	{
	int i = -5; while(i<=5)
	{
	if(i>=0)
	break;
	else
	{
	i++;
	continue;
	}
	printf("IARE");
	}
	return 0;
	}
	Output:
	i. 0 ii 10 iii 5 iv 3
		Understand	CO 2	ACSB01.07

6	Predict the output of the following?
	int main()
	{
	int i = 3; while (i--)
	{
	int i = 100; i--;
	printf("%d ", i);
	}
	return 0;
	}
		Understand	CO 2	ACSB01.07

7	Find the combination of the integer variables x, y and z makes the variable a get the value 4 in the following expression? a = (x > y) ? ((x > z) ? x : z) : ((y > z) ? y : z) i. x = 3, y = 4, z =2 ii. x = 6, y = 5, z =3 iii. x = 6, y = 3, z =5 iv. iv. x = 5, y = 4, z =5	Understand	CO 2	ACSB01.07

8	Predict the output of the following:
	int main()
	{
	int i;
	goto LOOP;
	for(i = 0 ; i< 10 ; i++)
	{
	printf("IARE\n"); LOOP:break;
	}
	return 0;
	}
		Understand	CO 2	ACSB01.07

9	Predict the output of the following:
	int main()
	{
	unsigned short int i = 65000; while(i++ != 0);
	printf("ans : %d", i); return 0;
	}
		Understand	CO 2	ACSB01.07

10	Predict the output of the following:
	
	#include<stdio.h>
	
	int main()
	{
	int i = 65; char j='A'; while(i< j);
	printf(" %d", (i ^ j)<< 2); return 0;
	}
		Understand	CO 2	ACSB01.07

MODULE – III				
ARRAYS AND FUNCTIONS				
Part - A (Short Answer Questions)				
1	What is an array and write the syntax to declare an array.	Remember	CO 3	ACSB01.08
2	State which of the following multi-dimensional array declaration is correct for realizing a 2x3 matrix? int m[2][3]; int m[3][2]; int m[3],m[2];	Understand	CO 3	ACSB01.08
3	Find the output of the following code?	Understand	CO 3	ACSB01.08

	void main(){
	int a[3][2] = {10, 20, 30, 40, 50, 60};
	printf("%d", a[0][4]);
	}			

4	Find the output of the following code?
	void main()
	{
	char s1[] = "jaihind"; char s2[] ="jaipur"; int x;
	x =strncmp(s1,s2,3); printf("x = %d", x);
	}
		Understand	CO 3	ACSB01.09

5	Find the output of the following code?
	void main()
	{
	char s1[] = "NEW DELHI"; char s2[] ="BANGALORE";
	strncpy(s1,s2,4); printf("%s", s1);
	}
		Understand	CO 3	ACSB01.09

6	Identify which of the following is used to represent the end of a string? i. Blankspace ii. Nullcharacter iii. Newlinecharacter iv. Last element of thestring	Remember	CO 3	ACSB01.08
7	Identify the string function used to find the sub- string in the main string and also write it‟s syntax?	Remember	CO 3	ACSB01.09

8	Find the output of the following code?
	void main()
	{
	char s1[] = "NEW DELHI";
	char s2[] ="NEW";
	printf("%d",strstr(s1,s2));
	}
		Understand	CO 3	ACSB01.09

9	Find the output of the following code?
	void main()
	{
	int a[4][3];
	printf("%d",sizeof(a));
	}
		Understand	CO 3	ACSB01.08

10	Write the syntax for strcat() and strncat() with example?	Remember	CO 3	ACSB01.09

11	Find the output of the following code?
	void main()
	{
	int i, j, a[][3]= {{1,2,3}, {4,5,6}};
	for(i=0; i< 2; i++)
	{
	for(j=0; j < 3;j++)
	printf("%5d", a[i][j]); printf("\n");
	}
	}
		Understand	CO 3	ACSB01.08

12	Write various methods of character array initialization with example?	Remember	CO 3	ACSB01.08
13	Write the syntax with example for the following string functions: i. strcmp() ii. strrev()	Remember	CO 3	ACSB01.09
14	Write the syntax and initialization procedure for a three dimensional array?	Remember	CO 3	ACSB01.08
15	Find the output of the following code? void main() {	Understand	CO 3	ACSB01.08

	int i, j, k;
	int
	a[][3][3]={{1,2,3,4,5,6,7,8,9},{10,11,12,13,14,15,16,17,18}};
	for(i=0; i< 2; i++)
	{
	for(j=0; j < 3;j++)
	{
	for(k=0; k < 3;k++)
	{
	printf("%5d", a[i][j][k]);
	}
	printf("\n");
	}
	printf("\n");
	}
	}			

16	What is the use of functions in programming?	Understand	CO 3	ACSB01.10
17	What is the syntax of a function, define some of the predefined Functions	Understand	CO 3	ACSB01.10
18	What is the difference between normal function and recursive function.	Understand	CO 3	ACSB01.11
19	Describe various parameter passing method.	Remember	CO 3	ACSB01.12
20	State the need for dynamic memory allocation and how does it help in building complex programs?	Remember	CO 3	ACSB01.12
	Part - B (Long Answer Questions)			
1	Define an array and explain the process of array initialization with example?	Understand	CO 3	ACSB01.08
2	Write C programs to find the largest and smallest number among a list of integers.	Understand	CO 3	ACSB01.08
3	Write C program to read a list of elements into an array and print the reverse of the list.	Understand	CO 3	ACSB01.08
4	Write C programs to read two matrices and find the addition and multiplication of two matrices.	Understand	CO 3	ACSB01.08
5	Write C programs to find the transpose of a matrix. e.g. Given matrix 1 2 3 4 5 6 Transpose of the matrix: 1 4 2 5 3 6	Understand	CO 3	ACSB01.08
6	Write a C program to store numbers into an array and find the frequency of a particular number in array and print it.	Understand	CO 3	ACSB01.08
7	Write a C program to copy the string str2 into str1 without using strcpy() function.	Understand	CO 3	ACSB01.09
8	Write a C program to check whether a string is palindrome or not without using string function.	Understand	CO 3	ACSB01.09
9	Write a C program to read your email id and print the number of vowels, consonants and special characters in it.	Understand	CO 3	ACSB01.09
10	Write a C program to insert a sub-string in to given main string at a given position without using string functions.	Understand	CO 3	ACSB01.09
11	Write a C program to read a lowercase string and convert it into uppercase.	Understand	CO 3	ACSB01.09
12	Write a C program to accept two strings and compare them. It should print	Understand	CO 3	ACSB01.09

	whether both are equal or first string is greater than the second or the first string is less than the second string.			
13	Write a C program to read N unsorted integers and sort them in ascending order.	Understand	CO 3	ACSB01.08
14	Explain the following string handling functions with example: i. strcpy() ii. strcat() iii. strrev() iv. strcmp() v. strupr()	Understand	CO 3	ACSB01.09
15	Write a C program to add a string at the end of another string and display the output. char a[20] = "hello"; char b[10] = "World"; Output: "HelloWorld"	Understand	CO 3	ACSB01.09
16	Write C programs that uses both recursive and non-recursive functions: a. Find the sum of n natural numbers b. Find the factorial of a given number	Understand	CO 3	ACSB01.10
17	Write a C program that uses functions to do the following: a. Convert decimal number to binary number b. Convert binary number to decimal number	Understand	CO 3	ACSB01.11
18	Write C programs that uses both recursive and non-recursive functions: a. Find the N^{th} Fibonacci number b. Find the reverse of a number	Understand	CO 3	ACSB01.10
19	Write a C program that uses functions to do the following: a. Convert a Roman letter into its decimal equivalent. b. Find 2"s complement of a binary number.	Understand	CO 3	ACSB01.10
20	Write a user defined function which takes an array of sorted integers and returns the median value? [Hint: For odd set of integers there will be a single median and for even set of integers, there will be two middle values and median is the average of the two middle values]	Understand	CO 3	ACSB01.10
Part - C (Problem Solving and Critical Thinking Questions)				

1	Predict the output of the following code?
	int main()
	{
	int arr1[]={97, 98, 99, 100, 101, 102, 103, 104, 105};
	int i=0; while(i++ < 5)
	printf("\n %c ", arr1[i++]); return 0;
	}
		Understand	CO 3	ACSB01.08

2	Find the output of the following code?
	void main()
	{
	int a[3] = {10, 20, 30};
	a[2] = 2;
	a[2 -2] = 2;
	printf("%d\t%d\t%d", a[0], a[1], a[2]);
	}
		Understand	CO 3	ACSB01.08

3	Find the output of the following code?
	void main()
	{
	char a[5] = "IARE"; int i =0;
	while(a[i])
	printf("%s\n", (a + i++)); }
		Understand	CO 3	ACSB01.08

4	Find error if any:
	Void main()
	{
	int x =5;
	int a[x]; a[1] = 12;
	printf("%d", a[1]);
	}
		Understand	CO 3	ACSB01.08

5	Find the output of the following code?
	void main()
	{
	int x[5] = {1, 2, 3, 4, 5};
	int i;
	for(i = 0; i< 20; i++) printf("%d\n", x[i]);
	}
		Understand	CO 3	ACSB01.08

6	Find the output of the following code?
	void main()
	{
	char s1[10] = "abc"; char s2[] = "abc"; if(s1 == s2)
	printf("yes both strings are
	same"); else
	printf("no both are different");
	}
		Understand	CO 3	ACSB01.09

7	Find the output of the following code?
	void main()
	{
	char s1[10] = "abc"; char s2[20];
	s2 = s1;
	printf("
	%s", s2);
	}
		Understand	CO 3	ACSB01.09

8	Find the output of the following code?
	void main()
	{
	char s[] = "hello";
	int i = 0, n = strlen(s); while(n)
	{
	n--;
	s[i] = s[n]; i++;
	}
	printf("%s", s);
	}
		Understand	CO 3	ACSB01.09

9	Find the output of the following code?
	void main()
	{
	char s[20]; int i;
	for(i=0; i< 3;i++) i[s] = ,,x";
	i[s] ="\0"; puts(s);}
		Understand	CO 3	ACSB01.08

10	Predict the output of the following code?
	void main()
	{
	int a1[10], a2[10];
	int i;
	for(i=1; i<=9; i++)
	{ a1[i] = 'A' + i;
	a2[i] = 'a' + i;
	printf("%d\n",
	a2[i] -a1[i]);
	}
	}
		Understand	CO 3	ACSB01.08

MODULE - IV				
STRUCTURES, UNIONS AND POINTERS				
Part - A (Short Answer Questions)				
1	Define a structure and state how the members of a structure are accessed with example?	Remember	CO 4	ACSB01.15
2	Write the major differences between arrays and structures?	Remember	CO 4	ACSB01.15
3	Write an example of nested structure?	Remember	CO 4	ACSB01.15
4	State the difference between a structure and union?	Remember	CO 4	ACSB01.15
5	Write an example of array of structures?	Remember	CO 4	ACSB01.15
6	Write the general format of sending a copy of a structure to the called Function?	Remember	CO 4	ACSB01.15
7	Describe the difference between Structure and Union	Remember	CO 4	ACSB01.15
8	Describe the syntax of nested structure	Remember	CO 4	ACSB01.15

9	Find the output of the following?
	struct
	{
	int i; float f;
	}var;
	void main()
	{
	var.i=5; var.f=9.76723;
	printf("%d %.2f",var.i,var.f);
	}
		Understand	CO 4	ACSB01.15

10	Write the output of the following?
	#include<stdio.h>
	struct values
	{
	int i;
	float f;
	};
	void main()
	{
	struct values
	var={555,67.05501};
	printf("%2d%.2f",var.i,var.f);
	}
		Understand	CO 4	ACSB01.15

11	Write the output of the following?
	union A
	{
	char ch; int i; float f;
	}temp; voidmain()
	{
	temp.ch='A';
	temp.i=777;
	temp.f=12345.12345;
	printf("%d", temp.i);
	}
		Understand	CO 4	ACSB01.15

12	Write the output of the following? void main() { struct employee {	Understand	CO 4	ACSB01.15

	unsigned id: 8; unsigned sex:1;
	unsigned age:7;
	};
	struct employee emp1={203,1,23};
	printf("%d\t%d\t%d",emp1.id,emp1.sex,emp1.age);
	}			

13	Write an example for enumerated data type?	Remember	CO 4	ACSB01.15
14	State the default starting value of enumerated set?	Remember	CO 4	ACSB01.15
15	Write the usage of typedef with example?	Remember	CO 4	ACSB01.15
16	Write the value of tulip from the following enumerated flowers? enum flowers{rose, lily = 5, lotus, tulip, sunflower);	Remember	CO 4	ACSB01.15
17	State the operator which connects the structure name to its member name?	Remember	CO 4	ACSB01.15

18	Consider the following C declaration
	struct {
	short s[5];
	union {
	float y; long z;
	}u;
	} t;
	Assume that objects of the type short float and long occupy 2 bytes, 4 bytes and 8 bytes, respectively.
		Remember	CO 4	ACSB01.15

19	Differentiate between structure and union with regard to memory allocation.	Understand	CO 4	ACSB01.15

20	Predict the output of following C program
	#include<stdio.h>
	struct Point
	{
	int x, y,z;
	};
	intmain()
	{
	struct Point p1 = {.y = 0, .z =
	1, .x =2}; printf("%d %d %d",
	p1.x, p1.y, p1.z); return0;
	}
		Understand	CO 4	ACSB01.15

Part - B (Long Answer Questions)				
1	Write a C program to read your full name, Date of birth and display the same using the concept of nested structure.	Understand	CO 4	ACSB01.15
2	Write a C program to maintain a book structure containing name, author and pages as structure members. Pass the address of structure variable to a user defined function and display the contents.	Understand	CO 4	ACSB01.15
3	A marketing company is having 50 employees and it maintains employee records in terms of their empid, empname, desg, salary, quantity, sales amount. The company gives 10% hike in salary to the employees if their sales amount is more than 50000/-. Write a C program that displays the employee records who got hike in salary.	Understand	CO 4	ACSB01.15
4	IARE College is maintaining student attendance records by storing rollno, stdname, attendance percentage in 5 different subjects. Write a C program using structures to find the average attendance percentage and print the following a. If attendance percentage >=75 then print student is eligible for writing final exam.	Understand	CO 4	ACSB01.15

	b. If attendance percentage >= 65 and <75 then print studentisincondonationlist. c. Otherwise not eligible for writingexams.			
5	Consider the declaration of the structure typedef struct { char x; char *y; int z[20]; } status; Discuss whether the following are valid, if invalid, give reason. a. struct statuss1; b. struct statuss2[25]; c. statuss3; d. status s4[20];	Understand	CO 4	ACSB01.15
6	Compare and Explain the following with suitable examples: a. Nested Structures b. Array ofstructures	Understand	CO 4	ACSB01.15
7	Explain the following with suitable example: a. self referential structures b. enumerated types	Remember	CO 4	ACSB01.15
8	Write a C program to pass a copy of the entire structure named stores containing members product-name, price and quantity to a function?	Understand	CO 4	ACSB01.15
9	Compare Unions and Structures .Explain the differences with examples.	Remember	CO 4	ACSB01.15
10	What are different ways of assigning values to structure members? Explain each method with examples.	Remember	CO 4	ACSB01.15
11	Explain three different approaches that can be used to pass structures as function arguments. Illustrate each of them with suitable example.	Remember	CO 4	ACSB01.15
12	Define a structure called complex consisting of two floating point numbers x and y and declare a variable p of type complex. Assign initial values 0.0 and 1.1 to the members.	Understand	CO 4	ACSB01.15
13	Define a structure data type called time_struct containing 3 members integer hour, integer minute and integer second. Develop a program that would assign values to the individual members and display the time in the following format:16 : 40 : 51	Understand	CO 4	ACSB01.15
14	Define a structure named census with the following 3 members: a. A character array city[ ] to store names. b. A long integer to store population of the city. c. A float member to store the literacy level. Write a program to do the following: d. To read details for 5 cities randomly using an array variable. e. To sort the list alphabetically. f. To sort the list based on literacy level. g. To sort the list based on population. c. To display sorted lists.	Understand	CO 4	ACSB01.15
15	Define a structure that can describe a hotel. It should have members that include the name, address, grade, average room charge, and number of rooms. Write functions to perform the following operations: a. To print out hotels of a given grade in order of charges. b. To print out hotels with room charges less than a given value.	Understand	CO 4	ACSB01.15
16	Define a structure called cricket that will describe the following information: Player name ,Team name ,Batting average using cricket, declare an array play program to read the information about all the 50 players and print a team-wise with their batting average.	Understand	CO 4	ACSB01.15

17	Define a slackbyte“? Explain how it affects the implementation of structures through sample code.	Remember	CO 4	ACSB01.15
18	Explain the meaning and purpose of the following: a. struct keyword b. Typedef keyword c. Sizeof operator	Understand	CO 4	ACSB01.15
19	Compare and contrast structures and unions. Write a C program to maintain a record of „n“ student details using an array of structures with four fields(rollno,name,marks and grade). Assume appropriate data type for each field. Print the marks of the student name as input.	Understand	CO 4	ACSB01.15
20	IARE maintains salary details of every employee by storing their name, department, basic pay, da, hra and cca. Store this information in a nested structure and display the salary of an employee.	Understand	CO 4	ACSB01.15
Part - C (Problem Solving and Critical Thinking Questions)				

1	Analyze the following program and find out the error in the program?
	#include<stdio.h>
	int main()
	{
	struct a
	{
	float category:5; char scheme:4;
	};
	printf("size=%d", sizeof(struct a));
	return 0; }
		Understand	CO 4	ACSB01.15

2	Predict the output of the program?
	#include<stdio.h> int main()
	{
	struct value
	{
	int bit1:1; int bit3:4; int bit4:4;
	}bit={1, 2, 13};
	printf("%d, %d, %d\n", bit.bit1, bit.bit3, bit.bit4);
	return 0;
	}
		Understand	CO 4	ACSB01.15

3	Verify the following statements which correctly assigns 12 to month using pointer variable pdt?
	#include<std io.h>
	struct date
	{
	int day;
	int month; int year;
	};
	int main()
	{
	struct date d; struct date*pdt; pdt = &d; return0;
	}
		Understand	CO 4	ACSB01.15

4	Predict the output of the program?
	#include<stdio.h>
	int main()
	{
	enum days {MON=-1, TUE, WED=6, THU, FRI, SAT};
	printf("%d, %d, %d, %d, %d, %d\n", MON, TUE, WED, THU, FRI,SAT);
	return 0;
	}
		Understand	CO 4	ACSB01.15

5	Analyze the program and identify the error in the program?
	#include<stdio.h>
	int main()
	{
	struct emp
	{
	char name[25]; intage;
	floatbs;
	};
	struct emp e; e.name = “suresh”; e.age = 25;
	printf(“%s %d\n”,
	e.name, e.age); return 0;
	}
		Understand	CO 4	ACSB01.15

6	Analyze the code and identify the statements which are correct in the following program?
	#include<stdio.h>
	int main()
	{
	union a
	{
	int i;
	char ch[2];
	};
	union a u1 = {512}; union a u2 = {0, 2};
	return 0;
	}
		Understand	CO 4	ACSB01.15

7	Analyze the following code and predict the output from printf() statement.
	struct student
	{
	char *name;
	};
	void main()
	{
	struct student s, m; s.name = "st";
	m = s;
	printf("%s%s", s.name, m.name);
	}
		Understand	CO 4	ACSB01.15

8	Analyze the following code and predict the output from printf() statement
	Struct
	{
	int foo, bar;
	} baz;
	int *example()
	{
	return &baz.foo;
	}
		Understand	CO 4	ACSB01.15

9	Analyze the following program and find the output of the program?
	char s[100];
	char *fun(char s[])
	{
	static
	int i =
	0;
	if(*s)
	{
	fun(s + 1);
	s[i] = *s; i++;
		Understand	CO 4	ACSB01.14

	}
	returns;
	}
	voidmain()
	{
	char s[] = “sample code”; printf(“%s”,
	fun(s));
	}			

10	Analyze the following program and find the output of the program?
	void main()
	{
	char s1[7] = “1234”, *p; p = s1 + 2;
	*p = „\0“; printf(“%s”, s1);
	}
		Understand	CO 4	ACSB01.14

MODULE - V				
FILE HANDLING AND BASICALGORITHMS				
Part - A (Short Answer Questions)				
1	Write the basic operations of a file?	Understand	CO 5	ACSB01.16
2	Write the various text file opening modes?	Remember	CO 5	ACSB01.17
3	State the various types of status enquiry library functions in C?	Remember	CO 5	ACSB01.16
4	Write the syntax and usage of ftell()?	Remember	CO 5	ACSB01.16
5	Write the purpose of fseek() with example?	Remember	CO 5	ACSB01.17
6	Write the syntax and usage of rewind()?	Remember	CO 5	ACSB01.17
7	Write the syntax of to open a file.	Understand	CO 5	ACSB01.16
8	What are files in C and what are uses?	Understand	CO 5	ACSB01.16
9	Find the meaning of „a“ in the following operation? fp = fopen(“sample.txt”,“a”);	Understand	CO 5	ACSB01.16
10	What are some of the library functions used to write data into files?	Remember	CO 5	ACSB01.17

11	Predict the output of this code?
	#include <stdio.h> int main()
	{
	FILE *fp = stdout; stderr= fp;
	fprintf(stderr, "%s", "hello");
	}
		Understand	CO 5	ACSB01.16

12	Find the output of this code?
	#include
	<stdio.h>
	#include<stdlib.h>
	int main()
	{
	FILE *fp = stdout; int n; fprintf(fp, "%d", 45);
	}
		Understand	CO 5	ACSB01.17

13	What are the error handling function for files in C?	Remember	CO 5	ACSB01.16

14	Predict the output of this code?
	#include
	<stdio.h>
	#include <string.h> int main()
	{
	char line[3]; fgets(line, 3, stdin);
	printf("%d\n", strlen(line)); return 0;
	}
		Understand	CO 5	ACSB01.17

15	Find the content of 'file.c' after executing the following program? #include<stdio.h> int main() {	Understand	CO 5	ACSB01.16

	FILE *fp1, *fp2; fp1=fopen("file.c", "w");
	fp2=fopen("file.c", "w"); fputc('A', fp1);
	fputc('B', fp2);
	fclose(fp1);
	fclose(fp2);
	return 0;
	}			

16	If the file 'source.txt' contains a line "Be my friend", predict the output of below program?
	#include<stdio.h >
	int main()
	{
	FILE *fs, *ft; char c[10];
	fs = fopen("source.txt", "r"); c[0] = getc(fs);
	fseek(fs, 0, SEEK_END); fseek(fs,-3L, SEEK_CUR);
	fgets(c, 5, fs); puts(c); return0;
	}
		Understand	CO 5	ACSB01.17

17	Identify the error in the program?
	#include<stdio.h>
	#include<stdlib.h>
	int main()
	{
	unsigned char; FILE *fp;
	fp=fopen("trial", "r"); if(!fp)
	{
	printf("Unable to open file"); exit(1);
	}
	fclose(fp); return 0;
	}
		Understand	CO 5	ACSB01.16

18	Justify why fseek() should be preferred over rewind().	Remember	CO 5	ACSB01.17
19	What is difference between file opening mode r+ and w+?	Remember	CO 5	ACSB01.17
20	What are first and second arguments of fopen ?	Remember	CO 5	ACSB01.16
	Part - B (Long Answer Questions)			
1	Write a C program to read a text file containing some paragraph. Use fseek()functionandreadthetextafterskipping„n‟‟charactersfrombeginningofthe file	Understand	CO 5	ACSB01.16
2	Explain the following functions through a sample program which reads a file „test.txt‟‟ . a. ftell() b. fseek() c. rewind()	Understand	CO 5	ACSB01.17
3	Write a C program to read a text file “sample.txt” and print the following.	Understand	CO 5	ACSB01.16
4	a. Substring of N characters from the positionI. b. Reverse order of substring of N characters produced ina.		CO 5	
5	Write the syntax of the following file I/O functions and Explain every option in each function with suitable example : a. fopen() b. fclose() c. fread() d. fwrite()	Understand	CO 5	ACSB01.16

6	Write a C program to open a file names INVENTORY and store in it the following data Item number price quantity Printer P1 Scanner S200 5500 5 Hard disk H300 4500 8 Read the data from the INVENTORY file and display the inventory table with the value of each item. [Hint: value = price * quantity and use fprintf() and fscanf() functions]	Understand	CO 5	ACSB01.16
7	Write a C program to read a given file, convert first letter of each word into uppercase and copy the contents of converted file into a new file.	Understand	CO 5	ACSB01.17
8	WriteaCprogramtoreadnameandmarksof„n‟numberofstudentsfrom user and store them in a file. If the file previously exists, then add the information of n students to the end of existing content.	Understand	CO 5	ACSB01.17
9	Write a C program to print the following from a given file: **1.** Number of characters **2.** Number of spaces **3.** Number of tabs **4.** Number of newlines	Understand	CO 5	ACSB01.16
10	Create a structure named employee containing name, age and basic pay. Write a C program to create 5 employee records and write to a file. Thenread the records from file and display it.	Understand	CO 5	ACSB01.17
11	Write a C program to maintain a record of “n” student details using an array of structures with four fields (Roll number, Name, Marks, and Grade). Each field is of an appropriate data type. Print the marks of the student given student name as input.	Understand	CO 5	ACSB01.16
12	Write a program to find the given element using linear searching	Understand	CO 5	ACSB01.17
13	Write a program to sort given array elements using insertion sort	Understand	CO 5	ACSB01.16
14	Define Algorithm and complexity of algorithm	Remember	CO 5	ACSB01.16
15	Explain the bubble sorting algorithm with an example	Understand	CO 5	ACSB01.17
	Part - C (Problem Solving and Critical Thinking Questions)			
1	In fopen(), the open mode "wx" is sometimes preferred "w" because. 1) Use of wxis moreefficient. 2) If w is used, old contents of file are erased and a new empty file is created. When wxis used, fopen() returns NULL if file already exists. a. Only1 b. Only2 c. Both 1 and2 d. Neither 1 and2	Understand	CO 5	ACSB01.17
2	Write a C program that request for a file name and an integer known as offset value. The program then reads the file starting from the location specified by the offset value and prints the contents on the screen. If the offset value is a positive integer then printing skips that many lines. If it is negative number it prints that many lines from the end of the file. An appropriate error message should be printed if anything goes wrong.	Understand	CO 5	ACSB01.16
3	Write a menu driven C program to add, display, search, update and delete the student record. Every student record contains name, roll no, age and marks in individual subjects.	Understand	CO 5	ACSB01.16
4	Write a function that, given a binary file, copies the odd items (items 1,3,5, …,n) to a second binary file and the even items (items 2,4,6, … , n) to a	Understand	CO 5	ACSB01.16

	third binary file. After all items have been copied, print the contents of both output files.			
5	Write a program in C to append multiple lines at the end of a text file. Assume that the content of the file test.txt is :test line1 test line2 test line3 test line 4 append the lines: test line5 test line6 test line7	Understand	CO 5	ACSB01.16

Signature of the faculty **HOD, CSE**