INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)
Dundigal, Hyderabad - 500 043

COMPUTER SCIENCE AND ENGINEERING
TUTORIAL QUESTION BANK

Course Name	**PROGRAMMING FOR PROBLEM SOLVING**
Course Code	**ACSB01**
Class	B. Tech II Semester
Branch	Common for CSE / IT / ECE / EEE / CIVIL
Year	2018 - 2019
Course Coordinator	Ms. B Padmaja, Associate Professor, CSE Ms. N Jayanthi, Assistant Professor, CSE
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COURSE OBJECTIVES (COs):
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 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	Question	Blooms Taxonomy Level	Course Learning Outcome (CLOs)
1	List the two major components of a computer system?	Remember	ACSB01.01
2	Identify the steps in creating and running a C program?	Remember	ACSB01.03
3	What are the different types of computing environments?	Remember	ACSB01.02
4	Define a flowchart and the symbols used in it?	Understand	ACSB01.03
5	State the properties of an algorithm?	Remember	ACSB01.02
6	List out the generations of computers?	Understand	ACSB01.02
7	What are the different types of computer programming languages?	Understand	ACSB01.02
8	Write the various classes of data types ANSI C supports?	Remember	ACSB01.05
9	State which of the following are valid identifiers. If invalid, state the reason. sample1 data_7 return #fine 91-080-100 name & age _val	Understand	ACSB01.05
10	What are the C tokens?	Remember	ACSB01.05
11	List out the rules for identifiers?	Remember	ACSB01.05
12	What is type casting and list its types?	Understand	ACSB01.05
13	Write the basic structure of a C program?	Understand	ACSB01.05
14	Define ternary or conditional operator with an example?	Understand	ACSB01.06
15	Find the value of x in the following expression? x = 3 / 2 % 6 – 3 / 9;	Understand	ACSB01.06
16	List out the bit-wise operators in C?	Understand	ACSB01.05
17	Write the size and range of the fundamental data types?	Remember	ACSB01.05
18	Explain the various key words related to data types and loops?	Remember	ACSB01.04
19	List out logical operators used in C language?	Understand	ACSB01.06
20	Write the basic escape sequence characters and its meaning with example?	Remember	ACSB01.06

21	Solve the expression and find output of the following code?
	void main()
	{
	    int i = -3 , j = 2, k = 0, m;
	    m = ++i && ++j && ++k;
	    printf("%3d%3d%3d%3d", i, j, k, m);
	}
		Understand	ACSB01.06

22	Find the output of the following code?
	int main()
	{
	    int a=5, b=4, res;
	    res = (a>b)?a:b;
	    printf("res = %d", res);
	    return 0;
	}
		Remember	ACSB01.06

23	Solve the expression and find output of the following code?
	``c
	void main()
	{
	        int x = !5 - 4 + 2 * 5;
	        printf("%d", x);
	}
	``
		Understand	ACSB01.06

24	Find the output of c, d, e and f in the below code?
	``c
	int main()
	{
	        float c = 15/10.0;
	        int d = 15/10;
	        float e = 15/10;
	        float f = 15.0/10.0;
	        printf("%.3f\t%d\t%.1f\t%.2f", c,d,e,f);
	        return 0;
	}
	``
		Understand	ACSB01.05

25	Find the output of the following code?
	``c
	int main()
	{
	        printf("%d"+1, 123);
	        return 0;
	}
	``
		Understand	ACSB01.05

26	Find the output of the following code?
	``c
	int main()
	{
	        printf("%d", printf("Hi!") + printf("Bye"));
	        return 0;
	}
	``
		Understand	ACSB01.06

27	Find the output of the following code?
	``c
	int main()
	{
	        printf("Work" "Hard");
	        return 0;
	}
	``
		Understand	ACSB01.06

28	Find the output of the following code?
	``c
	int main()
	{
	        int num1 = 10, num2 = 20;
	        int result;
	        result = num1 * 2 + num2 * 2 ;
	        printf("\nResult is :%d", result);
	        return 0;
	}
	``
		Understand	ACSB01.06

29	Find the output of the following code?
	Note: Assume two values are entered by the user are stored in the variables v and n respectively.
	``c
	int main()
	{
	        int v = 5, n;
	        printf("%d",scanf("%d%d", &v, &n));
	        return 0;
	}
	``
		Understand	ACSB01.04

30	Find the output of the following code?
	``c
	int main()
	{
	        int a = 500, b = 100, c = 30, d = 40, e = 19;
	        a += b -= c *= d /= e %= 5;
	        printf("%5d%5d%5d%5d%5d", a, b, c, d, e); return 0;
	}
	``
		Understand	ACSB01.06

31	Find the value of x, y, z for a = 9, b = 12, c = 3 (assume all are declared as float data type) a. x = a – b / 3 + c * 2 – 1; b. y = a – b / (3 + c) * (2 – 1); c. z = a – (b / (3 + c) * 2) – 1;	Understand	ACSB01.06

32	Find the output of the following code?
	int main()
	{
	      int a;
	      a = 015 + 0x15 + 5;
	      printf("%d", a);
	      return 0;
	}
		Understand	ACSB01.04

33	Find the output of the following code?
	int main()
	{
	      printf("%4d%4d%4d", sizeof(3.14), sizeof(3.14f), sizeof(3.14L));
	      return 0;
	}
		Understand	ACSB01.06

34	Find the output of the following code?
	int main()
	{
	      int a = 5, i;
	      a = ++i + ++i + ++i;
	      printf("%d", a);
	      return 0;
	}
		Understand	ACSB01.06

35	Find the output of the following code?
	int main()
	{
	      int x = 025;
	      printf("Decimal = %d\n", x);
	      printf("Octal = %o\n", x);
	      printf("Hexadecimal = %x\n", x);
	}
		Remember	ACSB01.04

36	Find the output of the following code?
	void main()
	{
	      int scanf = 10, getch = 20, putch;
	      putch = scanf + getch;
	      printf("%d", putch);
	}
		Understand	ACSB01.06

37	Find the output of the following code?
	int main()
	{
	      int a = 7, b = 4, c = 2,res;
	      res = a
		b & c;
		      printf("Result = %d\n", res);
		      return 0;
		}
			Understand	ACSB01.04

38	Find the output of the following code?
	void main()
	{
	      int x, y,z;
	      x = printf("one");
	      y=sizeof(printf("two"));
	      z=sizeof(x += y);
	      printf("%5d%5d%5d", x, y, z);
	}
		Understand	ACSB01.04

39	Find the output of the following code? int
	main()
	{
	    printf("%d",printf("C program"));
	    return 0;
	}
		Understand	ACSB01.06

40	Find the output of the following code?
	void main()
	{
	    int x=5, y=7,z;
	    z=(x==6)||(y=6);
	    printf("%5d%5d%5d", x, y, z);
	}
		Understand	ACSB01.06

PART – B (LONG ANSWER QUESTIONS)			

PART – B (LONG ANSWER QUESTIONS)			
1	Explain with a neat diagram the basic structure of a C program?	Understand	ACSB01.04
2	Find out what the decimal values of the following operations are: 1. 7 & 2 2. 1 & (~1) 3. 0 & 9 4. 7 & 9 5. 1 & 7 & 9 Explain the results?	Remember	ACSB01.06
3	The total distance travelled by a vehicle in t seconds is given by distance = ut + $(at^2)/2$ 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	ACSB01.04
4	Distance between two points (x_1, y_1) and (x_2, y_2) is governed by the formula $$D^2 = (x_2 - x_1)^2 + (y_2 - y_1)^2$$ Write a C program to compute D given the coordinates of the points.	Understand	ACSB01.04
5	Explain the various operators used in c programming and exemplify the use of ternary operator.	Understand	ACSB01.04
6	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	ACSB01.04
7	The ABC electric company manufactures four consumer products. Their inventory position on a particular day is given below. Write a C program to prepare the inventory report table in the following format: INVENTORY REPORT Code Quantity Rate Value - - - - - - - - - - - - Total Value: ---	Understand	ACSB01.05
8	Write a C program to read a three digit integer and print the sum of its digits.	Understand	ACSB01.06
9	What are the C tokens? Explain about each token in brief?	Remember	ACSB1.05

Inventory position table (Question 7):

Code	Quantity	Rate
F105	275	575.00
H220	107	993.95
I019	321	215.50
M315	89	725.00

10	Explain the fundamental data types along with its size and range?	Understand	ACSB01.03
11	Explain bit-wise operators with example?	Understand	ACSB01.05

12	Explain the following functions with example?
	  i. getc()
	  ii. putc()
	  iii. gets()
	  iv. puts()
		Understand	ACSB01.06

13	Explain the salient features and applications of C language?	Understand	ACSB01.05
14	Explain the modifiers used for data types in C language?	Understand	ACSB01.06
15	Explain type conversions in C with example?	Understand	ACSB01.06
16	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	Understand	ACSB01.05
17	Write a C program to find the size of primary data types using sizeof operator?	Understand	ACSB01.06
18	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	ACSB01.04
19	Write a C program to read the temperature in Fahrenheit and convert it into Celsius by using the formula $C = (F − 32) \times 5/9$	Understand	ACSB01.06
20	Explain the special operators in C with example?	Understand	ACSB01.05
21	Write a C program to find the area of a Circle and also draw a flowchart for it?	Understand	ACSB01.04
22	Write a C program to swap two numbers with and without using a third variable?	Understand	ACSB01.06
23	Write a C program to calculate the sum of N natural numbers without using a loop?	Understand	ACSB01.05
24	Draw a flowchart to find the factorial of a given number?	Understand	ACSB01.06
25	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	ACSB01.05
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 of x
	  iii. Toggles $(n+1)^{th}$ bit of x
	  iv. Unsets $(n+1)^{th}$ bit of x
		Understand	ACSB01.05

2	```c\n#include<stdio.h>\nint main(void)\n{\n int a = 1;\n int b = 0;\n b = a++ + a++;\n printf("%d %d",a,b);\n return 0;\n}\n```
	  i. 3 6
	  ii. Compiler Dependent
	  iii. 3 4
	  iv. 3 3
		Understand	ACSB01.05

3	What is the output of following program?
	``c
	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	ACSB01.05

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

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

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

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

8	Predict the output of following program?
	``c
	int main()
	{
	  int a = 2,b = 5;
	  a = a^b;
	  b = b^a;
	  printf("%d %d",a,b);
	  return 0;
	}
	``
		Understand	ACSB01.06

9	What is the output of the program?
	``c
	int main()
	{
	  int x = 10, y = 20, z = 5, i;
	  i = x < y < z;
	  printf("%d\n", i);
	  return 0;
	``
		Understand	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	ACSB01.04

MODULE - II

CONTROL STRUCTURES

PART – A (SHORT ANSWER QUESTIONS)

1	What is a control structure? List out their types.	Understand	ACSB01.07
2	Write a C program to check whether number is Prime or Not	Understand	ACSB01.07
3	What is the difference between while loop and do-while loop	Understand	ACSB01.07
4	Write a C program to check whether a number is positive or negative.	Understand	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	ACSB01.07

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

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

	if (c > a)
	    if (b < a)
	       printf("%d %d", c, a);
	  else if (b < c)
	      printf("%d %d", b, c);
	}			

12	Find the output of the following code?
	void main()
	{
	   int choice = 3;
	   switch(choice)
	   {
	     default: printf("default");
	     case 1: printf("choice 1"); break;
	     case 2: printf("choice 2"); break;
	   }
	}
		Understand	ACSB01.07

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

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

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

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

18	Find the output of the following code? void main()	Understand	ACSB01.07

| | ```
{
float i;
for(i = 0.1;i < 0.4; i += 0.1)
        printf("%.1f\n", i);
}
``` | | |
| 19 | Explain with example switch case execution process with and without break statement? | Understand | ACSB01.07 |
| 20 | Find the output of the following code?<br>```
void main()
{
     int i = 3;
     for(i--; i < 7; i = 7)
              printf("%d", i++);
}
``` | Understand | ACSB01.07 |
| 21 | Find errors if any from the following code?<br>```
int main()
{
        float x=3.5;
        switch(x)
        {
                case 3.1: printf("A");
                case 3.2: printf("B");
                case 3.3: printf("C");
        }
        return 0;
}
``` | Understand | ACSB01.07 |
| 22 | Find the output of the following code?<br>```
int main()
{
     int i=3,j=4,k=5;
     for(++i; i==j; k++)
         printf("hello %d", k);
     return 0;
}
``` | Understand | ACSB01.07 |
| 23 | Find the output of the following code?<br>```
int main()
{
     int i,j;
     for(i=1;i<3;i++)
     {
         for(j=1;j<3;j++)
         {
                 if(i==j)
                         break;
         }
     }
     printf("%5d%5d",i,j);
     return 0;
}
``` | Understand | ACSB01.07 |
| 24 | What is the output of the below program?<br>```
#include<stdio.h>
int main()
{
        int i = 0;
        switch (i)
        {
                case '0': printf("iare"); break;
                case '1': printf("Quiz"); break;
``` | Understand | ACSB01.07 |

	default: printf("IAREQuiz");
	}
	    return 0;
	}		

25	Find error if any?
	#include <stdio.h>
	int main()
	{
	    int i = 3 ,EVEN = 0,ODD = 1;
	    switch (i & 1)
	    {
	        case EVEN: printf("Even"); break;
	        case ODD: printf("Odd"); break;
	        default: printf("Default");
	    }
	    return 0;
	}
		Understand	ACSB01.07

26	Predict the output of the program?
	int main()
	{
	    int i;
	    if(printf("0"))
	        i = 3;
	    else
	        i = 5;
	    printf("%d", i); return 0;
	}
		Understand	ACSB01.07

27	Predict the output of the program?
	int i;
	int main()
	{
	    if(i)
	      ;
	    else
	      printf("False");
	    return 0;
	}
		Understand	ACSB01.07

28	Predict the output of the program?
	int main()
	{
	    int n;
	    for(n = 9; n!=0; n--)
	        printf("%d\n", n);
	    return 0;
	}
		Understand	ACSB01.07

29	Predict the output of the program?
	int main()
	{
	    int i = 0;
	    for (i=0; i<20; i++)
	    {
	        switch(i)
	        {
	          case 0: i += 5;
	          case 1: i += 2;
	          case 5: i += 5;
	          default: i += 4; break;
	        }
	        printf("%d ", i);
		Understand	ACSB01.07

	``
	        }
	        return 0;
	}
	``		

30	Predict the output of the program?
	``
	int main()
	{
	        int i = 0;
	        for(printf("1st\n"); i < 2 && printf("2nd\n"); ++i && printf("3rd\n"))
	        {
	                printf("\n");
	        }
	        return 0;
	}
	``
		Understand	ACSB01.07

31	Predict the output of the program?
	``
	int main()
	{
	        int i;
	        for (i = 1; i != 10; i += 2)
	                printf("\nExam");
	        return 0;
	}
	``
		Understand	ACSB01.07

32	Find the output of the following code?
	``
	int main()
	{
	    int i = 3;
	    switch (i)
	    {
	        case 0+1: printf("Exam"); break;
	        case 1+2: printf("Quiz"); break;
	        default: printf("Exam and Quiz");
	    }
	    return 0;
	}
	``
		Understand	ACSB01.07

33	Find the output of the following code?
	``
	int main()
	{
	     int i = 1, j;
	    for (; ;)
	    {
	        if (i)
	             j = --i;
	        if (j < 10)
	            printf("Exam", j++);
	         else
	            break;
	    }
	    return 0;
	}
	``
		Understand	ACSB01.07

34	Find the output of the following code?
	``
	int main()
	{
	        int a = 5;
	        switch(a)
	        {
	                default: a = 4;
	                case 6: a--;
	                case 5: a = a+1;
	                case 1: a = a-1;
	``
		Understand	ACSB01.07

	`        }`
	`        printf("%d\n", a);`
	`        return 0;`
	`}`			

35	Find the output of the following code?
	`int main()`
	`{`
	`        int i = 0;`
	`        for (i=0; i<20; i++)`
	`        {`
	`                switch(i)`
	`                {`
	`                        case 0: i += 5;`
	`                        case 1: i += 2;`
	`                        case 5: i += 5;`
	`                        default: i += 4; break;`
	`                }`
	`                printf("%d ", i);`
	`        }`
	`        return 0;`
	`}`
		Understand	ACSB01.07

<div align="center">**PART – B (LONG ANSWER QUESTIONS)**</div>

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	ACSB01.07
2	An electric power distribution company charges domestic consumers as follows: Consumption Units Rate of charge 0-20 Rs 0.50 per unit 201-400 Rs 100 + Rs0.65 per unit excess of 200 401-600 Rs 230 plus 0.80 per unit excess of 400 601 and above Rs 390 plus Rs 1.00 per unit excess of 600 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)	Understand	ACSB01.07

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 NO SIGNAL POINT.
		Understand	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	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, if a=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	ACSB01.07
6	Write a program that counts from one to ten, prints the values on a separate	Understand	ACSB01.07

	line for each, and includes a message of your choice when the count is 3 and a different message when the count is 7.		
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 Rs 5000/. ii. Commission is 2% for sales when sales amount is greater than 5000 and less than equal to 10000. iii. Commission is 5% for sales amount greater than 10000.	Understand	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 ASCII values A – Z 65 – 90 a – z 97 – 122 0 – 9 48 – 57 Special symbols 0 – 47, 58 – 64, 91 – 96, 123 - 127	Understand	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	ACSB01.07
10	Write a C program to produce the following output? \ 1 3 5 7 9 11 13 15 17 19	Understand	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	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	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 the nest pair of numbers of without computing the sum. Are any values of x also illegal? If so, test for them too.	Understand	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. $371 = 3^3 + 7^3 + 1^3$]	Understand	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	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	ACSB01.07
17	Write a C program to print first n lines of Floyd's Triangle. 1 2 3 4 5 6	Understand	ACSB01.07

	7　　8　　9　　10		
18	Write a C program to print the following series $1/1! + 2/2! + 3/3! + \ldots\ldots\ldots$	Understand	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	ACSB01.07
20	Write a C program to find the LCM and GCD of two integers?	Understand	ACSB01.07
	PART – C (PROBLEM SOLVING AND CRITICAL THINKING QUESTIONS)		

1	Predict the output of the following?
	<pre>int main()
	{
	   int i = 1024;
	   for (; i; i >>= 1)
	      printf("IARE");
	   return 0;
	}</pre>
		Understand	ACSB01.07

2	Find the final value of i, j, k from the code?
	<pre>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);
	}</pre>
		Understand	ACSB01.07

3	Predict the output of the following?
	<pre>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;
	                            }
	                    }
	            }
	        }
	}</pre>
		Understand	ACSB01.07

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

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

6	Predict the output of the following?
	
	``c
	int main()
	{
	    int i = 3;
	    while (i--)
	    {
	        int i = 100;
	        i--;
	        printf("%d ", i);
	    }
	    return 0;
	}
	``
		Understand	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. x = 5, y = 4, z = 5	Understand	ACSB01.07

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

9	Predict the output of the following:
	
	``c
	int main()
	{
	    unsigned short int i = 65000;
	    while(i++ != 0);
	``
		Understand	ACSB01.07

| | ```
    printf("ans : %d", i);
    return 0;
}
``` | | |
| 10 | Predict the output of the following:<br><br>```
#include<stdio.h>

int main()
{
    int i = 65;
    char j='A';
    while(i < j);
    printf(" %d", (i ^ j )<< 2);
    return 0;
}
``` | Understand | ACSB01.07 |

<table>
<tr><td colspan="4" align="center">MODULE - III</td></tr>
<tr><td colspan="4" align="center">ARRAYS AND FUNCTIONS</td></tr>
<tr><td colspan="4" align="center">PART – A (SHORT ANSWER QUESTIONS)</td></tr>
<tr><td>1</td><td>What is an array and write the syntax to declare an array.</td><td>Remember</td><td>ACSB01.08</td></tr>
<tr><td>2</td><td>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];</td><td>Understand</td><td>ACSB01.08</td></tr>
<tr><td>3</td><td>Find the output of the following code?

void main()
{
   int a[3][2] = {10, 20, 30, 40, 50, 60};
   printf("%d", a[0][4]);
}</td><td>Understand</td><td>ACSB01.08</td></tr>
<tr><td>4</td><td>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);
}</td><td>Understand</td><td>ACSB01.09</td></tr>
<tr><td>5</td><td>Find the output of the following code?
void main()
{
     char s1[] = "NEW DELHI";
     char s2[] ="BANGALORE";
     strncpy(s1,s2,4);
     printf("%s", s1);
}</td><td>Understand</td><td>ACSB01.09</td></tr>
<tr><td>6</td><td>Identify which of the following is used to represent the end of a string?
  i. Blank space
  ii. Null character
 iii. Newline character
 iv. Last element of the string</td><td>Remember</td><td>ACSB01.08</td></tr>
<tr><td>7</td><td>Identify the string function used to find the sub- string in the main string and also write it's syntax?</td><td>Remember</td><td>ACSB01.09</td></tr>
<tr><td>8</td><td>Find the output of the following code?
void main()
{
     char s1[] = "NEW DELHI";
     char s2[] ="NEW";</td><td>Understand</td><td>ACSB01.09</td></tr>
</table>

	`printf("%d",strstr(s1,s2));` `}`		

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

10	Write the syntax for strcat() and strncat() with example?	Remember	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	ACSB01.08

12	Write various methods of character array initialization with example?	Remember	ACSB01.08

13	Write the syntax with example for the following string functions:
	    i. strcmp()
	    ii. strrev()
		Remember	ACSB01.09

14	Write the syntax and initialization procedure for a three dimensional array?	Remember	ACSB01.08

15	Find the output of the following code?
	`void main()`
	`{`
	    `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");`
	    `}`
	`}`
		Understand	ACSB01.08

16	What is the use of functions in programming?	Understand	ACSB01.10
17	What is the syntax of a function, define some of the predefined functions	Understand	ACSB01.10
18	What is the difference between normal function and recursive function.	Understand	ACSB01.11
19	Describe various parameter passing method.	Remember	ACSB01.12
20	State the need for dynamic memory allocation and how does it help in building complex programs?	Remember	ACSB01.12
21	Write the principal difference between the functions malloc() and calloc()?	Remember	ACSB01.14
22	List out the dynamic memory allocation functions and write its general syntax?	Remember	ACSB01.14
23	Write the usage of realloc () and free () function with example?	Remember	ACSB01.14

24	Define scope of a variable?	Remember	ACSB01.13
25	Identify the storage class which allows the data to be stored in CPU?	Remember	ACSB01.13

26	Find errors if any:
	
	``c
	void main ()
	{
	    extern int x = 10;
	    printf ("%d", x);
	}
	``
		Understand	ACSB01.13

27	Find the output of the following code?
	
	``c
	extern int x;
	int x = 25; void
	main ()
	{
	    extern int x; printf
	    ("%d", x);
	}
	``
		Understand	ACSB01.13

28	Find the output of the following code?
	
	``c
	void main()
	{
	static int
	    i=5; if(-- i)
	    {
	        main();
	        printf("%d\t",i);
	    }
	}
	``
		Understand	ACSB01.13

29	Find the output of the following code?
	
	``c
	f(int i, int j)
	{
	    i = i+j;
	     printf("%5d%5d", i, j);
	}
	void main()
	{
	    f(1,2);
	    f(2,3);
	}
	``
		Understand	ACSB01.10

30	In C, if you pass an array as an argument to a function, predict what actually gets passed?	Remember	ACSB01.12

31	Find the output of the following code?
	
	``c
	void fun()
	{
	    static int s;
	    s = s+ 2;
	    printf("s = %d", s);
	}
	void main()
	{
	    fun();
	    fun();
	}
	``
		Understand	ACSB01.10

32	Find the output of the following code? int
	``c
	    add(int a, int b)
	    {
	        int c = a+b;
	    }
	    void main()
	``
		Understand	ACSB01.10

| | ```
{
    int a=10,b=20;
    printf("%2d %2d %2d",a, b, add(a,b));
}
``` | | | |
| 33 | Find the output of the following code? int<br>funct(char ch)<br>```
{
    ch=ch+1;
    return ch;
}
void main()
{
    int a=127;
    printf("%d %d", a, funct(a));
}
``` | Understand | ACSB01.10 |
| 34 | Write the output of the following code?<br>```
int val;
static int funct()
{
    return val*val;
}
void main()
{
    val=5;
    funct();
    val++;
    printf("%d",funct());
}
``` | Understand | ACSB01.10 |
| 35 | Write the output of the following code? void<br>main()<br>```
 {
    void
    funct1(void);
    void
    funct2(void);
    clrscr();
    funct1();
 }
void funct1(void)
 {
    printf("Ocean of ");
    funct2();
 }
void funct2(void)
 {
    printf("Knowledge");
 }
``` | Understand | ACSB01.10 |
| 36 | List the different types of user defined functions. | Understand | ACSB01.10 |
| 37 | Write the output of the following code? int<br>increment(int i)<br>```
{
    static  int   count=0;
    count =  count+ 1;
    return(count);
}
void main()
{
``` | Understand | ACSB01.10 |

	int i,j;
	for (i=0;i<=4;i++)
	      j = increment(i);
	printf("%5d", j);
	}		

38	Write the cases required for writing a recursive function?	Remember	ACSB01.12
39	State how a pointer variable can be declared and accessed with a suitable example?	Remember	ACSB01.14
40	Write about chain of pointers and explain with example?	Remember	ACSB01.14
41	Discuss the disadvantages of pointers with suitable illustrations?	Remember	ACSB01.14
42	State the arithmetic operations which are allowed in pointers? Explain each of them with example,.	Remember	ACSB01.14
43	What is Dangling state? Explain the purpose of NULL pointer in avoiding dangling state?	Remember	ACSB01.14
PART – B (LONG ANSWER QUESTIONS)			
1	Define an array and explain the process of array initialization with example?	Understand	ACSB01.08
2	Write C programs to find the largest and smallest number among a list of integers.	Understand	ACSB01.08
3	Write C program to read a list of elements into an array and print the reverse of the list.	Understand	ACSB01.08
4	Write C programs to read two matrices and find the addition and multiplication of two matrices.	Understand	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	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	ACSB01.08
7	Write a C program to copy the string str2 into str1 without using strcpy() function.	Understand	ACSB01.09
8	Write a C program to check whether a string is palindrome or not without using string function.	Understand	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	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	ACSB01.09
11	Write a C program to read a lowercase string and convert it into uppercase.	Understand	ACSB01.09
12	Write a C program to accept two strings and compare them. It should print whether both are equal or first string is greater than the second or the first string is less than the second string.	Understand	ACSB01.09
13	Write a C program to read N unsorted integers and sort them in ascending order.	Understand	ACSB01.08

14	Explain the following string handling functions with example:
	  i. strcpy()
	 ii. strcat()
	iii. strrev()
	 iv. strcmp()
	  v. strupr()
		Understand	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";	Understand	ACSB01.09

	Output: "HelloWorld"		

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	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	ACSB01.11
18	Write C programs that uses both recursive and non-recursive functions: a. Find the Nth Fibonacci number b. Find the reverse of a number	Understand	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	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	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	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	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	ACSB01.08

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

5	Find the output of the following code?
	`void main()`
	`{`
	`    int x[5] = {1, 2, 3, 4, 5};`
	`    int i;`
		Understand	ACSB01.08

| | ```
    for(i = 0; i< 20; i++)
        printf("%d\n", x[i]);
}
``` | | | |
| 6 | Find the output of the following code?<br>```
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 | ACSB01.09 |
| 7 | Find the output of the following code?<br>```
void main()
{
    char s1[10] = "abc";
    char s2[20];
    s2 = s1;
    printf("%s", s2);
}
``` | Understand | ACSB01.09 |
| 8 | Find the output of the following code?<br>```
void main()
{
    char s[] = "hello";
    int i = 0, n = strlen(s);
    while(n)
    {
        n--;
        s[i] = s[n];
        i++;
    }
    printf("%s", s);
}
``` | Understand | ACSB01.09 |
| 9 | Find the output of the following code?<br>```
void main()
{
    char s[20];
    int i;
    for(i=0; i< 3;i++)
        i[s] = 'x';
    i[s] ='\0';
    puts(s);
}
``` | Understand | ACSB01.08 |
| 10 | Predict the output of the following code?<br>```
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 | ACSB01.08 |

11	Consider the C function given below. Assume that the array listA contains n > 0 elements, sorted in ascending order. Explain the purpose of function ProcessArray?	Understand	ACSB01.10

```c
int ProcessArray(int *listA, int x, int n)
{
     int i, j, k; i =
     0;
     j = n- 1; do
     {
          k = (i+j)/2;
          if (x <= listA[k])
                    j = k- 1; if
          (listA[k]
          <= x)
                    i = k+1;
     }while (i <= j); if
     (listA[k] ==
     )
          return(k);
     else
          return -1;}
     }
```

12	Predict the output of the following code.	Understand	ACSB01.10

```c
void g(int x[10], int p)
{
     x[p] = p;
          x[p – p] = p;
}
void main()
{
     int arr[3] = {10, 20, 30};
     g(arr, 2);
     printf("%d%d%d", arr[0], arr[1], arr[2]);
}
```

13	Write a c program to calculate the power of a number using recursion	Understand	ACSB01.11

14	Explain the output of the following program?	Understand	ACSB01.10

```c
void f(int x, int y, int z)
{
     printf("%d%d%d", x, y, z);
}
void main()
{
     int x = 5, y= 6, z= 7;
     f(x = y, y = z+2, z = x+3);
}
```

15	Analyze the following program and find the output of the program?	Understand	ACSB01.12

```c
#include<stdio.h>
float square ( float x);
 int main( )
{
float m, n ;
printf ( "\nEnter some number for finding square\n");
scanf ( "%f", &m ) ;
n = square ( m ) ;
printf ( "\nSquare of the given number %f is %f",m,n );
}
float square ( float x )
{
```

	float p ; p = x * x ; return (p); }		

16	Analyze the following program and find the output of the program?
	
	    #include<stdio.h>
	
	    void swap(int a, int b);
	
	    int main()
	    {
	      int m = 22, n = 44;
	      printf(" values before swap m = %d \nand n = %d", m, n); swap(m, n);
	    }
	    void swap(int a, int b)
	    {
	      int tmp;
	      tmp = a;
	      a = b;
	      b = tmp;
	      printf(" \nvalues after swap m = %d\n and n = %d", a, b);
	    }
		Understand	ACSB01.12

17	#include<stdio.h>
	
	    void printTable(int);
	
	    int main()
	    {
	      int number;
	      printf("Enter an integer number: ");
	      scanf("%d",&number);
	      printf("Table of %d is:\n",number);
	      printTable(number);
	      return 0;
	    }
	
	    void printTable(int num)
	    {
	      int i;
	      for(i=1; i<=10; i++)
	       printf("%5d\n",(num*i));
	    }
		Understand	ACSB01.12

MODULE - VI

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	ACSB01.15
2	Write the major differences between arrays and structures?	Remember	ACSB01.15
3	Write an example of nested structure?	Remember	ACSB01.15
4	State the difference between a structure and union?	Remember	ACSB01.15
5	Write an example of array of structures?	Remember	ACSB01.15
6	Write the general format of sending a copy of a structure to the called Function?	Remember	ACSB01.15
7	Describe the difference between Structure and Union	Remember	ACSB01.15
8	Describe the syntax of nested structure	Remember	ACSB01.15

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

10	Write the output of the following?
	``c
	struct values
	  {
	      int i;
	      float f;
	  };
	  void main()
	  {
	      struct values var={555,67.05501};
	      printf("%2d %.2f",var.i,var.f);
	  }
	``
		Understand	ACSB01.15

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

12	Write the output of the following?
	``c
	void main()
	  {
	      struct employee
	      {
	          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);
	  }
	``
		Understand	ACSB01.15

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

18	Consider the following C declaration
	``c
	struct {
	    short s[5];
	``
		Remember	ACSB01.15

	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.		

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

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

21	Write the output of the following code?
	#include<stdio.h>
	struct
	{
	    int i;
	    float ft;
	}decl;
	int main()
	{
	    decl.i = 4;
	    decl.ft = 7.96623;
	    printf("%d %.2f", decl.i, decl.ft);
	    return 0;
	}
		Understand	ACSB01.15

22	Write the output of the following code?
	    void print(int *);
	    void print(int *);
	    void main()
	            {
	            int x=100;
	            print(& x);
	            }
	     void print(int *a)
	     {
	            printf("%d",*a);
	}
		Understand	ACSB01.14

23	Write about chain of pointers and explain with example?	Remember	ACSB01.14
24	Discuss the disadvantages of pointers with suitable illustrations?	Remember	ACSB01.14
25	State the arithmetic operations which are allowed in pointers? Explain each of them with example,.	Remember	ACSB01.14

26	Find the output of the
	following?
	void main()
	{
	    int n[3][2] = {3, 6, 9, 12, 15, 18};
	    printf("%2d%2d", *(n + 1)[1], **(n + 2));
	}
		Understand	ACSB01.14

	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	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	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	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. b. If attendance percentage >= 65 and <75 then print student isin condonation list. c. Otherwise not eligible for writing exams.	Understand	ACSB01.15

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 status s1;
	b. struct status s2[25];
	c. status s3;
	d. status s4 [20];
		Understand	ACSB01.15

6	Compare and Explain the following with suitable examples: a. Nested Structures b. Array of structures	Understand	ACSB01.15
7	Explain the following with suitable example: a. self referential structures b. enumerated types	Remember	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	ACSB01.15
9	Compare Unions and Structures .Explain the differences with examples.	Remember	ACSB01.15
10	What are different ways of assigning values to structure members? Explain each method with examples.	Remember	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	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	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	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.	Understand	ACSB01.15

	c. A float member to store the literacylevel. Write a program to do the following: a. To read details for 5 cities randomly using an array variable. b. To sort the list alphabetically. c. To sort the list based on literacy level. d. To sort the list based on population. e. To display sorted lists.		
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	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 playe program to read the information about all the 50 players and print a team-wise with their batting average.	Understand	ACSB01.15
17	Define a „slack byte"? Explain how it affects the implementation of structures through sample code.	Remember	ACSB01.15
18	Explain the meaning and purpose of the following: a. struct keyword b. typedef keyword c. sizeof operator	Understand	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 (roll no, name, marks and grade). Assume appropriate data type for each field. Print the marks of the student name as input.	Understand	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	ACSB01.15

21	Given the following structure and variable definitions,
	struct customer
	{
	   char lastName[15];
	   char firstName[15];
	   int customerNumber;
	    struct
	    {
	     char phoneNumber[11];
	     char address[50];
	     char city[15];
	     char state[3];
	     char zipCode[6];
	    } personal;
	  } customerRecord, *customerPtr;
	customerPtr = &customerRecord;
	Write an expression that can be used to access the structure member in each of the following parts:
	a) Member lastName of the structure pointed to by customerPtr.
	b) Member phoneNumber of member personal of structure customerRecord.
	c) Member phoneNumber of member personal of the structure pointed to by customerPtr.
	d) Member zipCode of member personal of the structure pointed to by customerPtr.
		Understand	ACSB01.15

22	A bookshop uses a personal computer to maintain the inventory of books that are being sold at the shop. The list includes details such as author, title, isbn number, price, author, stock position. Whenever a customer wants a book, the	Understand	ACSB01.15

	shopkeeper inputs the title or isbn number and the system replies whether the book is available or not. If it is not, an appropriate message is displayed. If book is in the list, then the system displays the book details and asks for number of copies. If the requested copies are available, the total cost of the books is displayed, otherwise the message "Requested copies are not in stock" is displayed. Implement using structures.			
23	Declare a calendar as an array of 366 elements. Each element of the array is a structure having three fields. The first field is the name of the month (a dynamically allocated string), the second field is the day of the month (an integer). The third field is the description of the activities for a particular day (a dynamically allocated string).	Understand	ACSB01.15
24	Define a structure called cricket that will describe the following information: Player name, team name, batting average. Using cricket, declare an array player with 10 elements and write a program to read the information about all the 50 players and print a team wise list containing names of players with their batting average.	Understand	ACSB01.15
25	Write a C program that accepts a set of 5 names using array of pointers concept and displays them?	Understand	ACSB01.14
26	Given the following declarations. int x=10, y=10; int * P1 = &x, *P2 = &y; What is the value of each of following expressions and explain why (i) (*P1) ++ (ii) - - (*P2) (iii) *P + (*P2)- - (iv) ++ (*P2) - * P1	Understand	ACSB01.14
27	Write a C program to read a list of N integers and sort it using pointers. [hint: use any sorting technique]	Understand	ACSB01.14
28	Write a C program to a. Add two numbers using pointers. b. Swap two numbers using pointers.	Understand	ACSB01.14
29	Write a c program to add two complex numbers by passing structure to a function	Understand	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	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);	Understand	ACSB01.15

	return 0; }			

3	Verify the following statements which correctly assigns 12 to month using pointer variable pdt?
	#include<stdio.h>
	struct date
	{
	int day;
	int month;
	int year;
	};
	int main()
	{
	struct date d;
	struct date *pdt;
	pdt = &d;
	return 0;
	}
		Understand	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	ACSB01.15

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

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

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

9	Analyze the following program and find the output of the program? char s[100];
	
	``c
	char *fun(char s[])
	{
	    static int i = 0;
	    if(*s)
	    {
	        fun(s + 1);
	        s[i] = *s; i++;
	    }
	    return s;
	}
	void main()
	{
	    char s[] = "sample code";
	    printf("%s", fun(s));
	}
	``
		Understand	ACSB01.14

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

11	Analyze the following program and find the output of the program?
	
	``c
	#include<stdio.h>
	int main()
	{
	    int a = 5;
	    int *ptr ;
	    ptr = &a;
	    *ptr = *ptr * 3;
	    printf("%d", a);
	
	    return 0;
	}
	``
		Understand	ACSB01.14

12	Analyze the following program and find the output of the program?
	#include<stdio.h>
	int main()
	{
	   int i = 6, *j, k;
	   j = &i;
	   printf("%d\n", i * *j * i + *j);
	   return 0;
	}
		Understand	ACSB01.14

<table>
<tr><td colspan="3" align="center">MODULE - V</td></tr>
<tr><td colspan="3" align="center">FILE HANDLING AND BASIC ALGORITHMS</td></tr>
<tr><td colspan="3" align="center">PART – A (SHORT ANSWER QUESTIONS)</td></tr>
</table>

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

11	Predict the output of this code?
	 #include <stdio.h>
	int main()
	{
	FILE *fp = stdout;
	 stderr= fp;
	fprintf(stderr, "%s", "hello");
	}
		Understand	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	ACSB01.17

13	What are the error handling function for files in C?	Remember	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	ACSB01.17

15	Find the content of 'file.c' after executing the following program?
	  #include<stdio.h>
	  int main()
	  {
		Understand	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);
	  return 0;
	}
		Understand	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	ACSB01.16

18	Justify why fseek() should be preferred over rewind().	Remember	ACSB01.17
19	What is difference between file opening mode r+ and w+?	Remember	ACSB01.17
20	What are first and second arguments of fopen ?	Remember	ACSB01.16
21	Define Algorithm and complexity of algorithm	Remember	ACSB01.16
22	Explain the bubble sorting algorithm with an example	Understand	ACSB01.17
	PART – B (LONG ANSWER QUESTIONS)		
1	Write a C program to read a text file containing some paragraph. Use fseek() function and read the text after skipping „n" characters from beginning of the file?	Understand	ACSB01.16
2	Explain the following functions through a sample program which reads a file „test.txt" . a. ftell() b. fseek() c. rewind()	Understand	ACSB01.17
3	Write a C program to read a text file "sample.txt" and print the following.	Understand	ACSB01.16
4	a. Substring of N characters from the position I. b. Reverse order of substring of N characters produced in a.		

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	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 P100 7500 10 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	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	ACSB01.17
8	Write a C program to read name and marks of „n‟ number of students from 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	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	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. Then read the records from file and display it.	Understand	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	ACSB01.16
12	Write a program to find the given element using linear searching	Understand	ACSB01.17
13	Write a program to sort given array elements using insertion sort	Understand	ACSB01.16
<td colspan="3" align="center">**PART – C (PROBLEM SOLVING AND CRITICAL THINKING QUESTIONS)**</td>
1	In fopen(), the open mode "wx" is sometimes preferred "w" because. 1) Use of wx is more efficient. 2) If w is used, old contents of file are erased and a new emptyfile is created. When wx is used, fopen() returns NULL if file already exists. a. Only 1 b. Only 2 c. Both 1 and 2 d. Neither 1 and 2	Understand	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	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	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 third binary file. After all items have been copied, print the	Understand	ACSB01.16

		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 line 1 test line 2 test line 3 test line 4 append the lines: test line 5 test line 6 test line 7	Understand	ACSB01.16

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