



INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad - 500 043

COMPUTER SCIENCE AND ENGINEERING

TUTORIAL QUESTION BANK

Course Name	COMPUTER PROGRAMMING
Course Code	ACS001
Class	B. Tech II Semester
Branch	Common for AE / CE /ME
Year	2017-2018
Course Coordinator	Mr.N Ramanjaneya Reddy, Associate Professor, CSE Dept.
Team of Instructors	Mr.N Ramanjaneya Reddy Mr. N Poorna Chandra Rao Mr.S Lakshman Kumar Ms.A Uma Datta Ms.A Swapna Ms.A Lakshmi

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:

CACS001.01	Identify and understand the working of key components of a computer system.
CACS001.02	Analyze a given problem and develop an algorithm to solve the problem.
CACS001.03	Describe the fundamental programming constructs and articulate how they are used to develop a program with a desired runtime execution flow.
CACS001.04	Gain knowledge to identify appropriate C language constructs to write basic programs.
CACS001.05	Identify the right data representation formats based on the requirements of the problem.
CACS001.06	Describe the operators, their precedence and associativity while evaluating expressions in program statements..
CACS001.07	Understand branching statements, loop statements and use them in problem solving.

CACS001.08	Learn homogenous derived data types and use them to solve statistical problems.
CACS001.09	Understand procedural oriented programming using functions.
CACS001.10	Understand how recursion works and write programs using recursion to solve problems.
CACS001.11	Differentiate call by value and call by reference parameter passing mechanisms.
CACS001.12	Understand pointers conceptually and apply them in C programs.
CACS001.13	Distinguish homogenous and heterogeneous data types and apply them in solving data processing applications.
CACS001.14	Explain the concept of file system for handling data storage and apply it for solving problems.
CACS001.15	Differentiate text files and binary files and write the simple C programs using file handling functions.
CACS001.16	Apply the concepts to solve real-time applications using the features of C language.
CACS001.17	Possess the knowledge and skills for employability and to succeed in national and international level competitive examinations.

TUTORIAL QUESTION BANK

UNIT – I			
INTRODUCTION			
PART – A (SHORT ANSWER QUESTIONS)			
S. No	Question	Blooms Taxonomy Level	Course Learning Outcome (CLOs)
UNIT – I			
INTRODUCTION			
1.	List the two major components of a computer system?	Remember	CACS001.01
2.	Identify the steps in creating and running a C program?	Remember	CACS001.03
3.	Write the steps used in problem solving?	Remember	CACS001.02
4.	Write the basic set of procedures that are followed by various organizations as program development life cycle methods?	Understand	CACS001.03
5.	State the properties of an algorithm?	Remember	CACS001.02
6.	Write the parameters which effects the run time of an algorithm?	Understand	CACS001.02
7.	State the need for measuring the complexity of an algorithm with an example?	Understand	CACS001.02
8.	Write the various classes of data types ANSI C supports?	Remember	CACS001.05
9.	State which of the following are valid identifiers. If invalid, state the reason. a. sample1 b. data_7 c. return d. #fine e. 91-080-100 f. name & age g. _val	Understand	CACS001.05
10.	Find the value of x in the following expression? $x = 3 / 2 \% 6 - 3 / 9;$	Understand	CACS001.06
11.	Find the output of following statement? <code>printf(“%s”,”IARE-2015”+5);</code>	Understand	CACS001.05
12.	Write the size and range of the basic data types?	Remember	CACS001.05

13.	Solve the expression and find output of the following code? <pre>void main() { int i = -3 , j = 2, k = 0, m; m = ++i && ++j && ++k; printf(“%%3d%3d%3d%3d”, i, j, k, m); }</pre>	Understand	CACS001.06
14.	Find the output of the following code? <pre>#include<stdio.h> int main() { int a=5, b=4; return (a>b)?a:b; }</pre>	Remember	CACS001.06
15.	Solve the expression and find output of the following code? <pre>void main() { int x = !5 – 4 + 2 * 5; printf(“%d”, x); }</pre>	Understand	CACS001.06
16.	Write the basic escape sequence characters and its meaning with example?	Remember	CACS001.06
17.	Find the output of c, d, e and f in the below code? <pre>float c = 15/10.0; int d = 15/10; float e = 15/10; float f = 15.0/10.0;</pre>	Understand	CACS001.05
18.	Find the output of the following code? <pre>int main() { printf(“%d”+1, 123); return 0; }</pre>	Understand	CACS001.05
19.	Find the output of the following code? <pre>int main() { printf(“%d”, printf(“Hi!”) + printf(“Bye”)); return 0; }</pre>	Understand	CACS001.06
20.	Find the output of the following code? <pre>int main() { printf(“Work” “Hard”); return 0; }</pre>	Understand	CACS001.06
21.	Find the output of the following code? <pre>int main() { int v = 10; printf(“%d”, v++, “%d”, v- -); return 0; }</pre>	Understand	CACS001.06

22.	<p>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.</p> <pre>int main() { int v = 5, n; printf("%d",scanf("%d%d", &v, &n)); return 0; }</pre>	Understand	CACS001.04
23.	<p>Find the output of the following code?</p> <pre>int main() { int a = 500, b = 100, c = 30, d = 40, e = 19; a += b -= c *= d /= e %= 5; printf("%2d%2d%2d%2d%2d", a, b, c, d, e); return 0; }</pre>	Understand	CACS001.06
24.	<p>Find the value of x, y, z for a = 9, b = 12, c = 3 (assume all are declared as float data type)</p> <p>a. $x = a - b / 3 + c * 2 - 1$; b. $y = a - b / (3 + c) * (2 - 1)$; c. $z = a - (b / (3 + c) * 2) - 1$;</p>	Understand	CACS001.06
25.	<p>Find the output of the following code?</p> <pre>int main() { int a; a = 015 + 0x15 + 5; printf("%d", a); return 0; }</pre>	Understand	CACS001.04
26.	<p>Find the output of the following code?</p> <pre>int main() { printf("%2d%2d%2d", sizeof(3.14), sizeof(3.14f), sizeof(3.14L)); return 0; }</pre>	Understand	CACS001.06
27.	<p>Find the output of the following code?</p> <pre>int main() { int a = 5; a = ++i + ++i + ++i; printf("%d", a); return 0; }</pre>	Understand	CACS001.06
28.	<p>Find the output of the following code?</p> <pre>int main() { int x = 025; printf("Decimal = %d\n", x); printf("Octal = %o\n", x); printf("Hexadecimal = %x\n", x); }</pre>	Remember	CACS001.04

29.	Find the output of the following code? Assume y = 6 and z = 7. <pre>int main() { int x = 5, y, z, p; p = printf("%d\n", scanf("%d%d", &y, &z)); printf("x=%d \t y=%d \t z = %d \t p= %d\n", x, y, z, p); }</pre>	Understand	CACS001.04
30.	Find the value of x and y in the following code? <pre>int main() { int x, y; x = sizeof("hello") - sizeof(int); printf("x = %d\n", x); y = sizeof(int) - sizeof(int); printf("y = %d", y); }</pre>	Understand	CACS001.06
31.	Find the output of the following code? <pre>void main() { int scanf = 10, getch = 20, putch; putch = scanf + getch; printf("%d", putch); }</pre>	Understand	CACS001.06
32.	Find the output of the following code? <pre>void main() { int i = 1, j = 2; { int i = 5; printf("%d\n", i + j); } printf("%d", i - j); }</pre>	Understand	CACS001.04
33.	Find the output of the following code? <pre>void main() { int x, y, z; x = printf("one"); y = sizeof(printf("two")); z = sizeof(x += y); printf("%5d%5d%5d", x, y, z); }</pre>	Understand	CACS001.04
34.	Find the output of the following code? <pre>void main() { int x = 3, y = 4, z; x++; y-1; z = x + y; printf("%5d%5d%5d", x, y, z); }</pre>	Understand	CACS001.06

35.	Find the output of the following code? <pre>void main() { int x=5, y=7,z; z=(x==6) (y=6); printf("%5d%5d%5d", x, y, z); }</pre>	Understand	CACS001.06
PART – B (LONG ANSWER QUESTIONS)			
1.	Write a program that counts from 1 to 12 and prints the count and its inversion to 5 decimal places for each count. This will require a floating point number. 1 1.00000 2 .50000 3 .33333 4 .25000	Understand	CACS001.04
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 Try to explain the results (hint: draw out the numbers as binary patterns, using the program listed)	Remember	CACS001.06
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 evaluate the distance travelled at regular intervals of time, given the values of u and a. The program should provide the flexibility to the user to select his own time intervals and repeat the calculations for different values of u and a.	Understand	CACS001.04
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	CACS001.04
5.	Area of a triangle is given by the formula $A = \sqrt{S(S - a)(S - b)(S - c)}$ Where a, b and c are sides of the triangle and 2S = a + b + c. Write a C program to compute the area of the triangle given the values of a, b, c.	Understand	CACS001.04
6.	The price of one kg of rice is Rs. 40.75 and one kg of sugar is Rs. 30. 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 30.00	Understand	CACS001.04
7.	Write a C program to read two floating point numbers using a scanf statement assign their sum to an integer variable and then output the values of all three variables.	Understand	CACS001.04

8.	Write a C program to print the value 345.6789 in fixed-point format with the following specifications: a. Correct to two decimal places b. Correct to five decimal places and c. Correct to zero decimal places	Understand	CACS001.05
9.	The ABC electric company manufactures four consumer products. Their inventory position on a particular day is given below. Code Quantity Rate(Rs.) F105 275 575.00 H220 107 993.95 I019 321 215.50 M315 89 725.00 Write a C program to prepare the inventory report table in the following format: INVENTORY REPORT Code Quantity Rate Value --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- Total Value: -----	Understand	CACS001.04
10.	Write a C program to read a four digit integer and print the sum of its digits. [Hint: use / and % operators]	Understand	CACS001.06

PART – C (PROBLEM SOLVING AND CRITICAL THINKING QUESTIONS)

1.	Find the output of the following code? int main() { printf(“Work” “Hard”); return 0; }	Understand	CACS001.05
2.	main() { float f =5.2; double d=5.2; int r= f==d; printf(“result r=%d”, r); } Analyze the above code and predict the output from printf() statement	Understand	CACS001.05
3.	main() { printf(“\nab”); printf(“\bsi”); printf(“\rha”); }	Understand	CACS001.05

	<pre> } </pre> <p>Analyze the above code and predict the output from printf() statement</p>		
4.	<pre> main() { extern int i; i=4; printf(“%d”,i); } </pre> <p>Analyze the above code and predict the output from printf() statement</p>	Understand	CACS001.04
5.	<p>Predict the output or error(s) for the following:</p> <pre> main() { int i=-3, j=0, k=1, l=-1,p; p=++i j++&&--k l--; printf(“result= %d”,p); } </pre>	Understand	CACS001.06
6.	<p>Find the output of the following piece of code.</p> <pre> char c[]="123sai"; printf(“%d %f %s “, c, c, c); </pre>	Understand	CACS001.05
7.	<pre> main() { int m=-1<<4; printf(“%d”, m); } </pre> <p>Analyze the above code and predict the output from printf() statement</p>	Understand	CACS001.06
8.	<pre> #define int char main() { int p=65; printf(“size of the variable p=%d”, sizeof(p)); } </pre> <p>Analyze the above code and predict the output from printf() statement</p>	Understand	CACS001.06
9.	<p>Find the value of “count” at the end of the execution of the following C program.</p> <pre> main incr (int i) { static int count = 0; count = count + i; printf(“%d”,count); } </pre>	Understand	CACS001.04
10.	<pre> main() { int p=3; p=!p>4; printf(“i=%d”, i); } </pre> <p>Analyze the above code and predict the output from printf() statement</p>	Understand	CACS001.06

11.	<pre>main() { register int r; printf("%p\n", &r); } </pre> <p>Analyze the above code and predict the output from printf() statement</p>	Understand	CACS001.04
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UNIT – II

CONTROL STRUCTURES, ARRAYS AND STRINGS

PART – A (SHORT ANSWER QUESTIONS)

1.	<p>Find the output of the following code?</p> <pre>void main() { int x=5; if(x = 6) printf("hello"); else printf("Bye"); } </pre>	Understand	CACS001.07
2.	<p>Find the output of the following code?</p> <pre>void main() { int i=5,j=6,k=7; if(i<j, j>k, i==k) printf("Correct"); else printf("Wrong"); } </pre>	Understand	CACS001.07
3.	<p>Find the output of the following code?</p> <pre>void main() { int x =10, y=8, z=1; if(++x ++y) { printf("%5d%5d%5d", x=y, y=z, z=5); } } </pre>	Understand	CACS001.07
4.	<p>Take x = 0, y = 0 and z = 1. Find the value of x, y, and z after executing the following code?</p> <pre>if(x) if(y) z = 3; else z = 2; </pre>	Understand	CACS001.07
5.	<p>Find the output of the following code?</p> <pre>int main() { int i = 1; for(; i < 4; i++); printf("%d", i); return 0; } </pre>	Understand	CACS001.07

6.	Find the output of the following code? <pre>int main() { int a, b; for(a = 0; a < 10; a++); for(b = 25; b > 9; b -= 3); printf("%d%d", a, b); return 0; }</pre>	Understand	CACS001.07
7.	Find the output of the following code? <pre>int main() { int a; for(a = 5; --a;) printf("%d", a); return 0; }</pre>	Understand	CACS001.07
8.	State the difference between entry controlled and exit controlled loop with example?	Remember	CACS001.07
9.	Write the usage of break and continue statement with example?	Remember	CACS001.07
10.	Find the output of the following code? <pre>int main() { int a = 1, b = 2, c = 3, d = 4, e; if(e = (a & b c ^ d)) printf("%d", e); return 0; }</pre>	Understand	CACS001.07
11.	Find the output of the following code? <pre>void 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); }</pre>	Understand	CACS001.07
12.	Find the output of the following code? <pre>void main() { int choice = 3; switch(choice) { default: printf("default"); case 1: printf("choice 1"); break; case 2: printf("choice 2"); break; } }</pre>	Understand	CACS001.07

13.	Find the output of the following code? <pre>void main() { char c = 125; do printf("%d", c); while(c++); }</pre>	Understand	CACS001.07
14.	Find the output of the following code? <pre>void main() { for(;;) { printf("%d", 10); } }</pre>	Understand	CACS001.07
15.	Find the output of the following code? <pre>void main() { printf("hi!"); if !(0) printf("bye"); }</pre>	Understand	CACS001.07
16.	Find the output of the following code? <pre>void main() { int a =1; if(a) printf("test"); else ; printf("again"); }</pre>	Understand	CACS001.07
17.	Find the output of the following code? <pre>void main() { int i =1; if(i++, ++i, i--, -i) printf("%d\n", i); }</pre>	Understand	CACS001.07
18.	Find the output of the following code? <pre>void main() { float i; for(i = 0.1; i < 0.4; i += 0.1) printf("%.1f\n", i); }</pre>	Understand	CACS001.07
19.	Find the output of the following code? <pre>void main() { int i; for(i = 2; i += 2; i <= 9; i +=2)</pre>	Understand	CACS001.07

	<pre> printf("%d\n", i); } </pre>		
20.	<p>Find the output of the following code?</p> <pre> void main() { int i = 3; for(i--; i < 7; i = 7) printf("%d", i++); } </pre>	Understand	CACS001.07
21.	<p>Find errors if any from the following code?</p> <pre> 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; } </pre>	Understand	CACS001.07
22.	<p>Find the output of the following code?</p> <pre> int main() { int i=3,j=4,k=5; for(++i; i==j; k++) { printf("hello %d", k); } return 0; } </pre>	Understand	CACS001.07
23.	<p>Find the output of the following code?</p> <pre> 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; } </pre>	Understand	CACS001.07
24.	<p>State the rule that determines the order in which initial values are assigned to multi dimensional array elements?</p>	Remember	CACS001.08
25.	<p>State which of the following is the correct syntax for the initialization of one-dimensional array?</p> <ol style="list-style-type: none"> num[3]={0 0 0}; num[3]={0,0,0}; num[3]={0;0;0}; num[3]=0 	Remember	CACS001.08

26.	State which of the following is the correct syntax for initialization of two-dimensional array? a. <code>table[2][3]={0,0,0,1,1,1};</code> b. <code>table[2][3]={</code> <code>{0,0,0}</code> <code>{1,1,1}</code> <code>};</code> c. <code>table[2][3]={0,1},{0,1},{0,1};</code>	Remember	CACS001.08
27.	State which of the following multi-dimensional array declaration is correct for realizing a 2x3 matrix? a. <code>int m[2][3]</code> b. <code>int m[3][2]</code> c. <code>int m[3],m[2]</code>	Remember	CACS001.08
28.	Find the output of the following code? <pre>void main() { int a[][3] = {{1, 2}, {3, 4, 5}, {5}}; printf("%3d%3d%3d", sizeof(a), a[0][2], a[1][2]); }</pre>	Understand	CACS001.08
29.	Write the output of the following code? <pre>void main() { int xxx[10] = {5}; printf("%3d%3d", xxx[1], xxx[9]); }</pre>	Understand	CACS001.08
30.	Write the output of the following code? <pre>void main() { int a[3][2] = {10, 20, 30, 40, 50, 60}; printf("%d", a[0][4]); }</pre>	Remember	CACS001.08
31.	Distinguish Lvalue and Rvalue of an array element? Explain the differences with example.	Remember	CACS001.08
32.	Is it possible to pass an entire array to a function as an argument? Justify your answer with a Suitable example?	Remember	CACS001.08
33.	Write the output of the following code? <pre>#include<string.h> void main() { char s1[] = "Anil kumar gupta"; char s2[] = "kumar"; printf(strstr(s1,s2)); }</pre>	Understand	CACS001.08
34.	Write the output of the following code? <pre>#include<string.h> void main() { char s1[] = "jaihind"; char s2[] = "jaipur"; int x; x =strncmp(s1,s2,3); printf("x = %d", x); }</pre>	Understand	CACS001.08

35.	Write the output of the following code? <pre>#include<string.h> void main() { char s1[] = "NEW DELHI"; char s2[] = "BANGALORE"; strncpy(s1,s2,4); printf("%s", s1); }</pre>	Understand	CACS001.08										
36.	State the correct syntax for copying a string S1 into S2?	Remember	CACS001.08										
37.	Identify which of the following is used to represent the end of a string? a. Blank space b. Null character c. Newline character d. Last element of the string	Remember	CACS001.08										
38.	Examine the code and identify the line no containing error? <pre>int a[10]; //line 1 int *p; //line 2 p=a; //line 3 a=p; //line 4</pre>	Remember	CACS001.08										
39.	Compare the following two strings using strcmp() function and display its return value? <pre>char x[5] = "ABCD"; char y[5] = "abcd";</pre>	Remember	CACS001.08										
40.	Identify the string function which is available in <string.h> to find the sub-string in the main string?	Understand	CACS001.08										
41.	State various string manipulation functions in C? Write syntax and give example to each of them.	Understand	CACS001.08										
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	CACS001.07										
2.	An electric power distribution company charges domestic consumers as follows: <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">Consumption Units</td> <td style="width: 50%;">Rate of charge</td> </tr> <tr> <td>0-20</td> <td>Rs 0.50 per unit</td> </tr> <tr> <td>201-400</td> <td>Rs 100 + Rs0.65 per unit excess of 200</td> </tr> <tr> <td>401-600</td> <td>Rs 230 plus 0.80 per unit excess of 400</td> </tr> <tr> <td>601 and above</td> <td>Rs 390 plus Rs 1.00 per unit excess of 600</td> </tr> </table> 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)	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	Understand	CACS001.07
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												
3.	Write a C program to display the traffic control signal lights based on the following. <ul style="list-style-type: none"> • If user entered character is R or r then print RED Light Please STOP. • If user entered character is Y or y then print YELLOW Light Please Check and Go. • If user entered character is G or g then print GREEN Light Please GO. • If user entered some other character then print THERE IS NO SIGNAL POINT. 	Understand	CACS001.07										

4.	<p>Admission to a professional course is subject to the following conditions:</p> <ol style="list-style-type: none"> Marks in Mathematics ≥ 60 Marks in Physics ≥ 50 Marks in Chemistry ≥ 40 Total in all three subjects ≥ 200 Total in Mathematics and Physics ≥ 150 <p>Given the marks in the three subjects, Write a C program to process the application to list the eligible candidates.</p>	Understand	CACS001.07										
5.	<p>Write a C program to compute the real roots of a quadratic equation $ax^2 + bx + c = 0$</p> <p>The roots are given by the equations</p> $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ <p>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:</p> <ol style="list-style-type: none"> No solution, if both a and b are zero There is only one root, if a=0 There are no real roots, if $b^2 - 4ac$ is negative Otherwise, there are two real roots <p>Write a C program to test all the above conditions.</p>	Understand	CACS001.07										
6.	<p>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.</p>	Understand	CACS001.07										
7.	<p>Write a C program to calculate commission for the input value of sales amount. Commission is calculated as per the following rules:</p> <ol style="list-style-type: none"> Commission is nil for sales amount Rs 5000/. Commission is 2% for sales when sales amount is greater than 5000 and less than equal to 10000. Commission is 5% for sales amount greater than 10000. 	Understand	CACS001.07										
8.	<p>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.</p> <table style="margin-left: 40px;"> <thead> <tr> <th><u>Characters</u></th> <th><u>ASCII values</u></th> </tr> </thead> <tbody> <tr> <td>A – Z</td> <td>65 – 90</td> </tr> <tr> <td>a – z</td> <td>97 – 122</td> </tr> <tr> <td>0 – 9</td> <td>48 – 57</td> </tr> <tr> <td>Special symbols</td> <td>0 – 47, 58 – 64, 91 – 96, 123 - 127</td> </tr> </tbody> </table>	<u>Characters</u>	<u>ASCII values</u>	A – Z	65 – 90	a – z	97 – 122	0 – 9	48 – 57	Special symbols	0 – 47, 58 – 64, 91 – 96, 123 - 127	Understand	CACS001.07
<u>Characters</u>	<u>ASCII values</u>												
A – Z	65 – 90												
a – z	97 – 122												
0 – 9	48 – 57												
Special symbols	0 – 47, 58 – 64, 91 – 96, 123 - 127												
9.	<p>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.</p>	Understand	CACS001.07										
10.	<p>Write a C program to produce the following output?</p> <pre> 1 3 5 7 9 11 13 15 17 19 </pre>	Understand	CACS001.07										
11.	<p>Write a C program for the following:</p> <ol style="list-style-type: none"> To print the reverse of an integer number To check whether the given integer is palindrome or not. 	Understand	CACS001.07										

12.	<p>Write a C program to print the numbers in triangular form.</p> <pre> 1 1 2 1 2 3 1 2 3 4 1 2 3 4 5 </pre>	Understand	CACS001.07
13.	<p>Write a C program to read in two numbers, x and n, and then compute the sum of this geometric progression $1+x+x^2+x^3+\dots+x^n$. 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 next pair of numbers of without computing the sum. Are any values of x also illegal? If so, test for them too.</p>	Understand	CACS001.08
14.	<p>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. $371 = 3^3 + 7^3 + 1^3$]</p>	Understand	CACS001.07
15.	<p>Write a C program to generate all prime numbers between 1 and n, where n value is supplied by the user.</p>	Understand	CACS001.07
16.	<p>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.</p> <pre> 1 1 1 1 2 1 1 3 3 1 1 4 6 4 1 </pre>	Understand	CACS001.07
17.	<p>Write a C program to print first n lines of Floyd's Triangle.</p> <pre> 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 </pre>	Understand	CACS001.07
18.	<p>Write a C program to print the following series $1/1! + 2/2! + 3/3! + \dots$</p>	Understand	CACS001.07
19.	<p>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.</p>	Understand	CACS001.07
20.	<p>Write a C program to produce the following form of Floyd's triangle</p> <pre> 1 2 3 4 5 6 7 8 9 10 </pre>	Understand	CACS001.07
21.	<p>Write C programs for the following:</p> <ol style="list-style-type: none"> Find the largest and smallest number among a list of integers. Read a list of elements into an array and print the reverse of the list. 	Understand	CACS001.08
22.	<p>Write C programs for the following:</p> <ol style="list-style-type: none"> Read two matrices and find the addition and multiplication of two matrices. Find the transpose of a matrix. 	Understand	CACS001.08

	e.g. Given matrix 1 2 3 4 5 6 Transpose of the matrix: 1 4 2 5 3 6		
23.	Write a C program to store numbers into an array and find the frequency of a particular number in array and print it.	Understand	CACS001.08
24.	Write a C program to read n unsorted numbers to an array of size n and pass the address of this array to a function to sort the numbers in ascending order using bubble sort technique.	Understand	CACS001.08
25.	Write a C program that: 1. Implements string copy operation STRCOPY(str1,str2) that copies a string str1 to another string str2 without using library function. 2. Reads a sentence and prints frequency of each of the vowels and total count of consonants.	Understand	CACS001.08
26.	Write a C program to check whether a given matrix is sparse matrix or not. The size of the matrix must be minimum 2x2.	Understand	CACS001.08
27.	Write a C program to read marks obtained by a class of 50 students in subject and count the number of students belonging to each of the following group of marks: 0-9, 10-19, 20-29, 30-39, 40-49,.....,100.	Understand	CACS001.08
28.	Write a C program accepts a string and returns true if the string is a palindrome and false if it is not, without using string built-in functions?	Understand	CACS001.08
29.	Write a C program to a. Check whether the given string is palindrome or not with and without using string functions. b. Insert a sub-string in to given main string from a given position.	Understand	CACS001.08
30.	Write a C program to a. Remove blank spaces from a string. b. Capitalize all the letters of a string.	Understand	CACS001.08
31.	Write a C program to accept two strings and compare them. Finally it prints whether both are equal, or first string is greater than the second or the first string is less than the second string	Understand	CACS001.08
PART – C (PROBLEM SOLVING AND CRITICAL THINKING QUESTIONS)			
1.	void main() { int i = 5, sum = 0; for(i; i; i+5) sum = sum + i; printf(“Sum = %d”, sum); } Analyze the above code and predict the output from printf() statement.	Understand	CACS001.07
2.	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	CACS001.07

	<pre> } Evaluate the final value of i, j, k from the above code? </pre>		
3.	<pre> 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%d%d”, i,j, k); continue; } } } } </pre> <p>Predict the output of the above code.</p>	Understand	CACS001.07
4.	<pre> switch (N % 6) { case 3: printf(“Wednesday”); default: printf(“Sunday”); case 5: printf(“Friday”); } </pre> <p>In the above code if N = 27, then predict the output of the code?</p>	Understand	CACS001.07
5.	<p>Consider the C function given below. Assume that the array listA contains n > 0 elements, sorted in ascending order.</p> <pre> 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] == x) return(k); else return -1; } </pre> <p>Explain the purpose of function ProcessArray?</p>	Understand	CACS001.08
6.	<pre> void g(int x[10], int p) { x[p] = p; x[p - p] = p; } void main() </pre>	Understand	CACS001.08

	<pre>{ int arr[3] = {10, 20, 30}; g(arr, 2); printf("%d%d%d", arr[0], arr[1], arr[2]); }</pre> <p>Predict the output of the above code.</p>		
7.	<pre>char a[5] = "IARE"; int i =0; while(a[i]) printf("%s\n", (a + i++));</pre> <p>Find the output of the above code.</p>	Understand	CACS001.08
8.	<pre>for(putchar('C');putchar('A');putchar('R')) putchar('T');</pre> <p>Predict the output of the above code.</p>	Understand	CACS001.08
9.	<pre>main() { static int i=3; printf("%d",i--); if(i) main(); }</pre>	Understand	CACS001.08

UNIT – III

FUNCTIONS AND POINTERS

PART – A (SHORT ANSWER QUESTIONS)

1.	State the advantage of user defined functions?	Remember	CACS001.09
2.	State various types of functions used in C?	Remember	CACS001.09
3.	State the difference between actual and formal parameters?	Remember	CACS001.09
4.	Write the need for a function prototype with an example?	Remember	CACS001.09
5.	State the various types of functions depending upon categories of arguments and return statements with example?	Remember	CACS001.09
6.	Define a recursive function and explain with an example?	Remember	CACS001.10
7.	Discuss the advantages and disadvantages of recursion?	Remember	CACS001.10
8.	Find the output of the following code? <pre>void main () { static int v = 5; printf ("%d\t", v--); if(v) main(); }</pre>	Understand	CACS001.10
9.	Write the default return type for a function with an example?	Remember	CACS001.09
10.	Distinguish between the following: a. Automatic and static variables b. Scope and visibility of variables	Understand	CACS001.09
11.	Identify the invalid prototype declarations if any with valid reasons: a. int (f1) void; b. void f2 (void, void); c. void f3 (int a, int &b);	Understand	CACS001.09
12.	Find errors if any, in the following function definitions: <pre>int abc (int a, int b) { double c = a + b; return (c);</pre>	Understand	CACS001.09

	}		
13.	Find errors if any, in the following function calls: a. xyz (int x, int y); b. xyz () + xyz (); c. xyz (void);	Understand	CACS001.09
14.	Find the output of the following code? int prod (int m, int n); void main () { int x = 10, y = 20, p, q; p = prod (x, y); q = prod(p, prod (x, y)); printf(“%5d%5d”, p, q); } int prod (int a, int b) { return (a * b); }	Understand	CACS001.09
15.	Find the output of the following code? int test (int num) { int m,n=0; while(num) { m = num%10; if(m%2) n=n+1; num = num / 10; } return(n); } void main () { int r; r = test(135); printf("Result = %d", r); }	Understand	CACS001.09
16.	State the reasons that is likely to happen when the following situations are encountered in a program: a. Actual parameters are less than the formal arguments in a function. b. The order of actual parameters in the function call is different from the order of formal parameters in a function where all the parameters are of the same type.	Remember	CACS001.09
17.	State the need for dynamic memory allocation and how does it help in building complex programs?	Remember	CACS001.12
18.	Write the principal difference between the functions malloc() and calloc()?	Remember	CACS001.12
19.	List out the dynamic memory allocation functions and write its general syntax?	Remember	CACS001.12
20.	Write the usage of realloc () and free () function with example?	Remember	CACS001.12
21.	Define scope of a variable?	Remember	CACS001.12

22.	Identify the storage class which allows the data to be stored in CPU?	Remember	CACS001.12
23.	Find errors if any: <pre>void main () { extern int x = 10; printf ("%d", x); }</pre>	Understand	CACS001.04
24.	Find the output of the following code? <pre>extern int x; int x = 25; void main () { extern int x; printf ("%d", x); }</pre>	Understand	CACS001.04
25.	Find the output of the following code? <pre>void main() { static int i=5; if(--i) { main(); printf("%d\t",i); } }</pre>	Understand	CACS001.04
26.	Find the output of the following code? <pre>f(int i, int j) { i = i+j; printf("%5d%5d", i, j); } void main() { f(1,2); f(2,3); }</pre>	Understand	CACS001.09
27.	In C, if you pass an array as an argument to a function, predict what actually gets passed?	Remember	CACS001.09
28.	Find the output of the following code? <pre>void fun() { static int s; s = s+ 2; printf("s = %d", s); } void main() { fun(); fun(); }</pre>	Understand	CACS001.09

29.	<p>Find the output of the following code?</p> <pre> int add(int a, int b) { int c = a+b; } void main() { int a=10,b=20; printf("%2d %2d %2d",a, b, add(a,b)); } </pre>	Understand	CACS001.09
30.	<p>Find the output of the following code?</p> <pre> int funct(char ch) { ch=ch+1; return ch; } void main() { int a=127; printf("%d %d", a, funct(a)); } </pre>	Understand	CACS001.09
31.	<p>Write the output of the following code?</p> <pre> int val; static int funct() { return val*val; } void main() { val=5; funct(); val++; printf("%d",funct()); } </pre>	Understand	CACS001.09
32.	<p>Write the output of the following code?</p> <pre> void main() { void funct1(void); void funct2(void); clrscr(); funct1(); } void funct1(void) { printf("Ocean of "); funct2(); } void funct2(void) { printf("Knowledge");} </pre>	Understand	CACS001.09
33.	<p>Write the output of the following code?</p> <pre> void print(int *); void print(int *); void main() </pre>	Understand	CACS001.12

	<pre> { int x=100; print(&x); } void print(int *a) { printf("%d",*a); } </pre>		
34.	<p>Write the output of the following code?</p> <pre> int increment(int i) { static int count =0; count = count + 1; return(count); } void main() { int i,j; for (i=0;i<=4;i++) j = increment(i); printf("%5d", j); } </pre>	Understand	CACS001.09
35.	Explain the advantages of Dynamic allocation of Memory using the concept of Pointers in C.	Remember	CACS001.12
36.	State how a pointer variable can be declared and accessed with an example?	Remember	CACS001.12
37.	Write about chain of pointers and explain with example?	Remember	CACS001.12
38.	Discuss the disadvantages of pointers with suitable illustrations?	Remember	CACS001.12
39.	State the arithmetic operations which are allowed in pointers? Explain each of them with example,.	Remember	CACS001.12
40.	What is Dangling state? Explain the purpose of NULL pointer in avoiding dangling state?	Remember	CACS001.12
41.	<p>Find the output of the following?</p> <pre> void main() { int n[3][2] = {3, 6, 9, 12, 15, 18}; printf(“%2d%2d”, *(n + 1)[1], ***(n + 2)); } </pre>	Understand	CACS001.12
42.	<p>Find the value of *y, *(y + 1) for the following program fragment:</p> <pre> char x [] = “Life is beautiful”; char *y = &x [3]; </pre>	Understand	CACS001.12
43.	<p>Given int x = 10, y = 10; int *p1 = &x, *p2 = &y; Find the value of each of the following expressions:</p> <ol style="list-style-type: none"> (*p1)++ -- (*p2) 	Understand	CACS001.12
44.	<p>Identify the correct expression for declaring a pointer to a function?</p> <ol style="list-style-type: none"> int (*p) (void); int *p (void); 	Understand	CACS001.12
45.	<p>Find the output of the following segment?</p> <pre> int m[2]; *(m + 1) = 100; </pre>	Understand	CACS001.12

	<pre>*m = *(m + 1); printf ("%d", m [0]);</pre>		
46.	Use void pointer to print the value of x and ch? <pre>int *ip, x = 5; char *cp, ch = 'a'; void *vp;</pre>	Understand	CACS001.12
47.	Write the procedure for swapping two strings using pointers?	Remember	CACS001.12
48.	Write the significance of void pointer?	Remember	CACS001.12
49.	State the role of preprocessor?	Remember	CACS001.09
50.	List out the categories of preprocessor directives?	Remember	CACS001.09
51.	Write the different forms of macro substitution with example?	Remember	CACS001.09
52.	State different forms of file inclusion with example?	Remember	CACS001.09
53.	List out miscellaneous preprocessor directives with example?	Remember	CACS001.09
54.	Write the advantages of macro definitions in a program?	Remember	CACS001.09
55.	The value of a macro name cannot be changed during running of a program. Write your comments?	Understand	CACS001.09
56.	Write the need for conditional compilation and how does it help a programmer?	Remember	CACS001.09
57.	Distinguish between #ifdef and #if directives?	Remember	CACS001.09
58.	Define a macro and state how it is different from a C variable name?	Remember	CACS001.09
59.	List out the precautions one should take when using macros with argument?	Remember	CACS001.09
60.	Enumerate the differences between functions and parameterized macros?	Understand	CACS001.09
PART – B (LONG ANSWER QUESTIONS)			
1.	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	CACS001.10
2.	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	CACS001.09
3.	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	CACS001.10
4.	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	CACS001.09
5.	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	CACS001.09
6.	Write the program expr, which evaluates a reverse Polish expression	Understand	CACS001.10

	from the command line, where each operator or operand is a separate argument. For example, <code>expr 2 3 4 + *</code> Evaluates: <code>2 * (3+4)</code> .		
7.	Define a character array and use "strcpy" to copy a string into it. Print the string out by using a loop with a pointer to print out one character at a time. Initialize the pointer to the first element and use the double plus sign to increment the pointer. Use a separate integer variable to count the characters to print.	Understand	CACS001.08, CACS001.12
8.	Write a C function <code>isprime(num)</code> that accepts an integer argument and returns 1 if the argument is prime, a 0 otherwise. Write a C program that invokes this function to generate prime numbers between the given ranges.	Understand	CACS001.09
9.	Write a C program to find the seat position in a second class sleeper coach for the given seat number? [Hint: The sleeper coach has 72 seats and in each cabin there are 8 seats. Seat position: lower berth, upper berth, middle berth, side lower and side upper]	Understand	CACS001.09
10.	Write a C program to print the tomorrow's date for the given today's date. [Hint: Suppose today's date is 31 st March 2016, then the next day will be 1 st April 2016]	Understand	CACS001.09
11.	Distinguish between the following: a. Actual and formal arguments b. Scope and visibility of variables	Remember	CACS001.04
12.	Write a C program using function that reads an array of integers and reverses the elements of an array using pointers?	Understand	CACS001.08, CACS001.09
13.	Write a C program to read lines of text from the keyboard, count and display the occurrence of a particular word in that text?	Understand	CACS001.08, CACS001.09
14.	List out the advantages of using pointers and explain generic (void) pointers with a suitable example?	Remember	CACS001.12
15.	Write a C program that accepts a set of 5 names using array of pointers concept and displays them?	Understand	CACS001.12
16.	Given the following declarations. <code>int x=10, y=10;</code> <code>int * P1 = &x, *P2 = &y;</code> What is the value of each of following expressions and explain why (i) <code>(*P1) ++</code> (ii) <code>-- (*P2)</code> (iii) <code>*P + (*P2) --</code> (iv) <code>++ (*P2) - * P1</code>	Understand	CACS001.12
17.	Write a C program to pass a multi-dimensional array to a function containing marks of students and display it on the screen?	Understand	CACS001.08 CACS001.09
18.	Write a C program to read a list of N integers and sort it using pointers. [hint: use any sorting technique]	Understand	CACS001.12
19.	Write a C program to read a string and find the number of vowels, Consonants, digits and white spaces in that string?	Understand	CACS001.08 CACS001.09
20.	Write a C program to a. Copy the elements of one array to another array using pointers. b. Read two strings and compare these two strings character by character. Display the similar characters found in both the strings	Understand	CACS001.08 CACS001.09

	and count the number of dissimilar characters.		
21.	Write a C program to a. Add two numbers using pointers. b. Swap two numbers using pointers.	Understand	CACS001.09 CACS001.12
22.	Write a C program to a. Read the name of a person as input and prints the name in an abbreviated fashion, e.g. Ram Kumar as R K b. Read a line of text and count all occurrence of a particular word.	Understand	CACS001.08 CACS001.09
23.	Explain the following: a. Process of pointer initialization with an example? b. Distinguish between (*m)[5] and *m[5]?	Understand	CACS001.12
24.	Write a function day_name that receives a number n and returns a pointer to a character string containing the name of the corresponding day. The day names should be kept in a static table of character strings local to the function?	Understand	CACS001.08 CACS001.09
25.	Given the following declarations: int x = 10, y = 10; int *p1 = &x, *p2 = &y; Find the values of the following expressions: a. (*p1) ++ b. --(*p2) c. *p1 + (*p2) -- d. ++(*p2) - *p1	Understand	CACS001.12
PART – C (PROBLEM SOLVING AND CRITICAL THINKING QUESTIONS)			
1.	Explain the output of the following program? 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); }	Understand	CACS001.09
2.	Consider the following C program main() { int x, y, m, n; scanf ("%d %d", &x, &y); /* x > 0 and y > 0 */ }	Understand	CACS001.12
3.	Analyze the following program and find the output of the program? #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) {	Understand	CACS001.12

	<pre> float p ; p = x * x ; return (p) ; } </pre>		
4.	<p>Analyze the following program and find the output of the program?</p> <pre> #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); } </pre>	Understand	CACS001.12
5.	<pre> #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)); } </pre>	Understand	CACS001.12
6.	<p>Analyze the following program and find the output of the program?</p> <pre> int fun(int a, int b) { printf("\n a = %d", a); printf("\n b = %d", b); } void main() { int(*fptr)(int,int); </pre>	Understand	CACS001.12

	<pre> fptr = func; func(2, 3); fptr(2,3); </pre>		
7.	<p>Analyze the following program and find the output of the program?</p> <pre> char s[100]; 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)); } </pre>	Understand	CACS001.12
8.	<p>Analyze the following program and find the output of the program?</p> <pre> void main() { char s1[7] = "1234", *p; p = s1 + 2; *p = '\0'; printf("%s", s1); } </pre>	Understand	CACS001.12
9.	<p>Consider the following three C functions :,</p> <pre> [P1] int *g (void) { int x = 10; return (&x); } [P2] int *g (void) { int *px; *px = 10; return px; } [P3] int *g (void) { int *px; px = (int *) malloc (sizeof(int)); *px = 10; return px; } </pre> <p>Identify which of the above three functions are likely to cause problems with pointers?</p> <ol style="list-style-type: none"> Only P3 Only P1 and P3 Only P1 and P2 P1, P2 and P3 	Understand	CACS001.12

10.	<p>Find the output of the following C program?</p> <pre> int f(int x, int *py, int **ppz) { int y, z; **ppz += 1; z = **ppz; *py += 2; y = *py; x += 3; return x + y + z; } void main() { int c, *b, **a; c = 4; b = &c; a = &b; printf("%d", f(c,b,a)); getchar(); } </pre>	Understand	CACs001.12
11.	<p>Consider the C program shown below. Find the output of this program code?</p> <pre> # define print(x) printf ("%d", x) int x; void Q(int z) { z += x; print(z); } void P(int *y) { int x = *y+2; Q(x); *y = x-1; print(x); } main(void) { x=5; P(&x); print(x); getchar(); } </pre>	Understand	CACs001.12
12.	<p>Analyze the following program and identify the error in the program?</p> <pre> void main() { char ch = 'c'; char c = 'a'; char *const ptr = &ch; ptr = &c; } </pre>	Understand	CACs001.07

13.	<p>Predict the output of the following code?</p> <pre>double foo (double); /* Line 1 */ int main () { double da, db; // input da db = foo (da); } double foo (double a) { return a; }</pre>	Understand	CACS001.09
14.	<pre>char *foo() { char *start = "hello"; char *end = start + 5; return (start + end) / 2; }</pre> <p>Analyze the piece of code and predict the return value.</p>	Understand	CACS001.12
15.	<pre>char foo() { char hello[] = "hello"; char *foo = hello; return (foo); }</pre> <p>Analyze the piece of code and predict the return value.</p>	Understand	CACS001.12

UNIT – IV

STRUCTURES AND UNIONS

PART – A (SHORT ANSWER QUESTIONS)

1.	Define a structure and state how the members of a structure are accessed with example?	Remember	CACS001.13
2.	Write the major differences between arrays and structures?	Remember	CACS001.13
3.	Write an example of nested structure?	Remember	CACS001.13
4.	State the difference between a structure and union?	Remember	CACS001.13
5.	Write an example of array of structures?	Remember	CACS001.13
6.	Write the general format of sending a copy of a structure to the called function?	Remember	CACS001.13
7.	<p>The uninitialized integer data type of a structure contains which of the following default values</p> <ol style="list-style-type: none"> Garbage Zero One 	Remember	CACS001.13
8.	Identify the following expressions which are correct for accessing the 'num' variable value of the i th element of a structure array 'student'	Remember	CACS001.13

	<ul style="list-style-type: none"> a. student[i].num b. student.num[i] c. student[i]->num 		
9.	<p>Find the output of the following?</p> <pre> struct { int i; float f; }var; void main() { var.i=5; var.f=9.76723; printf("%d %.2f",var.i,var.f); } </pre>	Understand	CACS001.13
10.	<p>Write the output of the following?</p> <pre> struct values { int i; float f; }; void main() { struct values var={555,67.05501}; printf("%2d %.2f",var.i,var.f); } </pre>	Understand	CACS001.13
11.	<p>Write the output of the following?</p> <pre> 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); } </pre>	Understand	CACS001.13
12.	<p>Write the output of the following?</p> <pre> 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); } </pre>	Understand	CACS001.13
13.	<p>Write an example for enumerated data type?</p>	Remember	CACS001.13

14.	State the default starting value of enumerated set?	Remember	CACS001.13
15.	Write the usage of typedef with example?	Remember	CACS001.13
16.	Write the value of tulip from the following enumerated flowers? enum flowers{rose, lily = 5, lotus, tulip, sunflower};	Remember	CACS001.13
17.	State the operator which connects the structure name to its member name?	Remember	CACS001.13
18.	Size of a union is determined by size of the. a. First member in the union b. Last member in the union c. Biggest member in the union d. Sum of the sizes of all members	Remember	CACS001.13
19.	Find the size of the following union declaration? union Temp { double a; int b[10]; char c; }; (Assuming size of double = 8, size of int = 4, size of char = 1)	Understand	CACS001.13
20.	Bit fields can only be declared as part of a structure a. false b. true c. can't say d. none	Understand	CACS001.13

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	CACS001.13
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	CACS001.13
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	CACS001.13
4.	IARE College is maintaining student attendance records by storing rollno, stdname, attendance percentage in 5 different subjects. Write a C program 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 is in condonation list. c. Otherwise not eligible for writing exams.	Understand	CACS001.13
5.	Consider the declaration of the structure typedef struct { char x; char *y; int z[20];	Understand	CACS001.13

	<p>} status; Discuss whether the following are valid, if invalid, give reason.</p> <ol style="list-style-type: none"> struct status s1; struct status s2[25]; status s3; status s4 [20]; 		
6.	<p>Compare and Explain the following with suitable examples:</p> <ol style="list-style-type: none"> Nested Structures Array of structures 	Understand	CACS001.13
7.	<p>Explain the following with suitable example:</p> <ol style="list-style-type: none"> self referential structures enumerated types 	Remember	CACS001.13
8.	<p>Write a C program to pass a copy of the entire structure named 'stores' containing members product-name, price and quantity to a function?</p>	Understand	CACS001.13
9.	<p>Compare Unions and Structures . Explain the differences with examples.</p>	Remember	CACS001.13
10.	<p>What are different ways of assigning values to structure members? Explain each method with examples.</p>	Remember	CACS001.13
11.	<p>Explain three different approaches that can be used to pass structures as function arguments. Illustrate each of them with suitable Example.?</p>	Remember	CACS001.13
12.	<p>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.</p>	Understand	CACS001.13
13.	<p>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</p>	Understand	CACS001.13
14.	<p>Define a structure named census with the following 3 members:</p> <ol style="list-style-type: none"> A character array city[] to store names. A long integer to store population of the city. A float member to store the literacy level. <p>Write a program to do the following:</p> <ol style="list-style-type: none"> To read details for 5 cities randomly using an array variable. To sort the list alphabetically. To sort the list based on literacy level. To sort the list based on population. To display sorted lists. 	Understand	CACS001.13
15.	<p>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:</p> <ol style="list-style-type: none"> To print out hotels of a given grade in order of charges. To print out hotels with room charges less than a given value. 	Understand	CACS001.13
16.	<p>Define a structure called cricket that will describe the following information: Player name Team name Batting average Using cricket, declare an array player with 50 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</p>	Understand	CACS001.13

	average.		
17.	Define a 'slack byte'? Explain how it affects the implementation of structures through sample code.	Remember	CACS001.13
18.	Explain the meaning and purpose of the following: a. struct keyword b. typedef keyword c. sizeof operator	Understand	CACS001.13
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	CACS001.13
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	CACS001.13
21.	Given the following structure and variable definitions, <pre> 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; </pre> 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	CACS001.13
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 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.	Understand	CACS001.13
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	Understand	CACS001.13

	activities for a particular day (a dynamically allocated string).		
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	CACS001.13
PART – C (PROBLEM SOLVING AND CRITICAL THINKING QUESTIONS)			
1.	Analyze the following program and find out the error in the program? <pre>#include<stdio.h> int main() { struct a { float category:5; char scheme:4; }; printf("size=%d", sizeof(struct a)); return 0; }</pre>	Understand	CACS001.13
2.	Predict the output of the program? <pre>#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; }</pre>	Understand	CACS001.13
3.	Verify the following statements which correctly assigns 12 to month using pointer variable pdt? <pre>#include<stdio.h> struct date { int day; int month; int year; }; int main() { struct date d; struct date *pdt; pdt = &d; return 0; }</pre>	Understand	CACS001.13

4.	Predict the output of the program? <pre>#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; }</pre>	Understand	CACS001.13
5.	Analyze the program and identify the error in the program? <pre>#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; }</pre>	Understand	CACS001.13
6.	Analyze the code and identify the statements which are correct in the following program? <pre>#include<stdio.h> int main() { union a { int i; char ch[2]; }; union a u1 = {512}; union a u2 = {0, 2}; return 0; }</pre> <p>a. u2 CANNOT be initialized as shown. b. u1 can be initialized as shown. c. To iniatialize char ch[] of u2 ‘.’ Operator should be used. d. The code causes an error ‘Declaration syntax error’</p>	Understand	CACS001.13
7.	<pre>struct student { char *name; }; void main() { struct student s, m; s.name = "st"; m = s; printf("%s%s", s.name, m.name); }</pre>	Understand	CACS001.13

	<pre> } </pre> <p>Analyze the above code and predict the output from printf() statement</p>		
8.	<pre> Struct { int foo, bar; } baz; int *example() { return &baz.foo; } </pre> <p>Analyze the above code and predict the value of return statement.</p>	Understand	CACS001.13
UNIT – V			
FILES			
PART – A (SHORT ANSWER QUESTIONS)			
1.	Write the basic operations of a file?	Understand	CACS001.13
2.	Write the various text file opening modes?	Remember	CACS001.15
3.	State the various types of status enquiry library functions in C?	Remember	CACS001.15
4.	Write the syntax and usage of ftell()?	Remember	CACS001.15
5.	Write the purpose of fseek() with example?	Remember	CACS001.15
6.	Write the syntax and usage of rewind()?	Remember	CACS001.15
7.	<p>Find the output of the following</p> <pre> int main() { FILE *fp = stdin; int n; fprintf(fp, "%d", 45); } </pre>	Understand	CACS001.14
8.	<p>If there is any error while opening a file, fopen() will return?</p> <ol style="list-style-type: none"> Nothing EOF NULL Depends on compiler 	Understand	CACS001.15
9.	<p>Find the meaning of 'a' in the following operation?</p> <pre> fp = fopen("sample.txt", "a"); </pre>	Understand	CACS001.15
10.	<p>Identify which is correct about a FILE</p> <ol style="list-style-type: none"> A structure tag declared in stdio.h One of the basic data types in c Pointer to the structure defined in stdio.h It is a type name defined in stdio.h 	Remember	CACS001.15
11.	<p>Predict the output of this code?</p> <pre> #include <stdio.h> int main() </pre>	Understand	CACS001.15

	<pre> { FILE *fp = stdout; stderr = fp; fprintf(stderr, "%s", "hello"); } </pre>		
12.	<p>Find the output of this code?</p> <pre> #include <stdio.h> #include <stdlib.h> int main() { FILE *fp = stdout; int n; fprintf(fp, "%d", 45); } </pre>	Understand	CACS001.14
13.	<p>Find which is true about stdout, stdin and stderr?</p> <ol style="list-style-type: none"> File pointers File descriptors Streams Structure 	Remember	CACS001.14
14.	<p>Predict the output of this code?</p> <pre> #include <stdio.h> #include <string.h> int main() { char line[3]; fgets(line, 3, stdin); printf("%d\n", strlen(line)); return 0; } </pre>	Understand	CACS001.15
15.	<p>Find the content of 'file.c' after executing the following program?</p> <pre> #include<stdio.h> int main() { 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; } </pre>	Understand	CACS001.15
16.	<p>If the file 'source.txt' contains a line "Be my friend", predict the output of below program?</p> <pre> #include<stdio.h> int main() { FILE *fs, *ft; char c[10]; fs = fopen("source.txt", "r"); </pre>	Understand	CACS001.15

	<pre> c[0] = getc(fs); fseek(fs, 0, SEEK_END); fseek(fs, -3L, SEEK_CUR); fgets(c, 5, fs); puts(c); return 0; } </pre>		
17.	<p>Identify the error in the program?</p> <pre> #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; } </pre>	Understand	CACS001.15
18.	<p>Identify which is true about fseek() ? fseek() should be preferred over rewind() mainly because</p> <ol style="list-style-type: none"> rewind() doesn't work for empty files rewind() may fail for large files In rewind, there is no way to check if the operations completed successfully All of the above 	Remember	CACS001.14
19.	<p>When fopen() is not able to open a file, it returns</p> <ol style="list-style-type: none"> EOF NULL Runtime Error Compiler Dependent 	Remember	CACS001.14
20.	<p>Identify which of the following is true about FILE *fp</p> <ol style="list-style-type: none"> FILE is a keyword in C for representing files and fp is a variable of FILE type. FILE is a structure and fp is a pointer to the structure of FILE type FILE is a stream FILE is a buffered stream 	Remember	CACS001.14
PART – B (LONG ANSWER QUESTIONS)			
1.	<p>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?</p>	Understand	CACS001.14
2.	<p>Explain the following functions through a sample program which reads a file 'test.txt' .</p> <ol style="list-style-type: none"> ftell() fseek() rewind() 	Understand	CACS001.14
3.	<p>Write a C program to read a text file "sample.txt" and print the following.</p>	Understand	CACS001.14

	<p>a. Substring of N characters from the position I.</p> <p>b. Reverse order of substring of N characters produced in a.</p>																		
4.	<p>Write the syntax of the following file I/O functions and Explain Every option in each function with suitable example :</p> <p>a. fopen() b. fclose() c. fread() d. fwrite()</p>	Understand	CACS001.14																
5.	<p>Write a C program to open a file names INVENTORY and store in it the following data</p> <table border="1"> <thead> <tr> <th>Item</th> <th>number</th> <th>price</th> <th>quantity</th> </tr> </thead> <tbody> <tr> <td>Printer</td> <td>P100</td> <td>7500</td> <td>10</td> </tr> <tr> <td>Scanner</td> <td>S200</td> <td>5500</td> <td>5</td> </tr> <tr> <td>Hard disk</td> <td>H300</td> <td>4500</td> <td>8</td> </tr> </tbody> </table> <p>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]</p>	Item	number	price	quantity	Printer	P100	7500	10	Scanner	S200	5500	5	Hard disk	H300	4500	8	Understand	CACS001.15
Item	number	price	quantity																
Printer	P100	7500	10																
Scanner	S200	5500	5																
Hard disk	H300	4500	8																
6.	<p>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.</p>	Understand	CACS001.15																
7.	<p>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.</p>	Understand	CACS001.14																
8.	<p>Write a C program to print the following from a given file:</p> <ol style="list-style-type: none"> Number of characters Number of spaces Number of tabs Number of newlines 	Understand	CACS001.14																
9.	<p>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.</p>	Understand	CACS001.14																
10.	<p>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.</p>	Understand	CACS001.14																
PART – C (PROBLEM SOLVING AND CRITICAL THINKING QUESTIONS)																			
1.	<p>In fopen(), the open mode "wx" is sometimes preferred "w" because.</p> <ol style="list-style-type: none"> Use of wx is more efficient. If w is used, old contents of file are erased and a new empty file is created. When wx is used, fopen() returns NULL if file already exists. <p>a. Only 1 b. Only 2 c. Both 1 and 2 d. Neither 1 and 2</p>	Understand	CACS001.15																
2.	<p>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</p>	Apply	CACS001.16																

	anything goes wrong.		
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.	Apply	CACS001.16
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 contents of both output files.	Apply	CACS001.16

Prepared by:

Mr. N Ramanjaneya Reddy Associate Professor, CSE Dept.

HOD, COMPUTER SCIENCE AND ENGINEERING