



INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad - 500 043

COMPUTER SCIENCE AND ENGINEERING

TUTORIAL QUESTION BANK

Course Name	Data Structures
Course Code	BCS002
Class	I M.Tech
Branch	CSE/IT
Year	2016 - 2017
Team of Instructors	S.Laxman Kumar

OBJECTIVES

To meet the challenge of ensuring excellence in engineering education, the issue of quality needs to be addressed, debated and taken forward in a systematic manner. Accreditation is the principal means of quality assurance in higher education. The major emphasis of accreditation process is to measure the outcomes of the program that is being accredited.

In line with this, faculty of Institute of Aeronautical Engineering, Hyderabad has taken a lead in incorporating philosophy of outcome based education in the process of problem solving and career development. So, all students of the institute should understand the depth and approach of course to be taught through this question bank, which will enhance learner's learning process.

PART – A (SHORT ANSWER QUESTIONS)

S. No	QUESTIONS	Blooms taxonomy level	Course outcome
UNIT – I			
OVERVIEW OF DATA STRUCTURES			
1.	Define the term algorithm and state the criteria the algorithm should satisfy	Remember	5
2.	Define Time Complexity and Space Complexity	Remember	5
3.	Define asymptotic notations: big 'Oh', omega and theta?	Remember	5
4.	Describe best case, average case and worst case efficiency of an algorithm?	Remember	5
5.	How do you measure the algorithm running time?	Understand	6
6.	Describe the role of space complexity and time complexity in measuring the performance of a program?	Understand	5
7.	Define data structure?	Remember	3
8.	List linear and nonlinear data structures?	Remember	3
9.	List out any four applications of data structures?	Understand	4

S. No	QUESTIONS	Blooms taxonomy level	Course outcome
10.	Define Linked List? State the different types of linked lists?	Remember	6
11.	List the advantages and disadvantages of linked list?	Remember	6
12.	Define Stack? List the applications of stack?	Remember	6
13.	Define Queue? List the applications of queue?	Remember	6
14.	List out the basic operations that can be performed on a stack and queue?	Remember	6
15.	Define Circular Queue? List the operations that can be performed on Circular Queue?	Remember	6
16.	Define Circular Queue full condition?	Remember	6
17.	Define DEQUEUE? List the operations that can be performed on DEQUEUE?	Remember	6
18.	Define priority Queue? List the applications of priority queue?	Remember	6
19.	State the different ways of representing expressions?	Remember	6
20.	State the rules to be followed during infix to postfix conversions?	Remember	6
21.	Convert the infix expression $(a+b)-(c*d)$ into post fix form?	Apply	4
22.	Write the necessity of infix to post fix conversion?	Understand	4
23.	Explain the difference between stack implementation using array and linked list?	Understand	4
24.	Write the Dequeue empty condition?	Remember	6
25.	Define heap?	Remember	6
26.	Differentiate Max-heap and Min-heap?	Understand	6

PART – B (LONG ANSWER QUESTIONS)

S. No	Question	Blooms Taxonomy Level	Course Outcome
UNIT – I OVERVIEW OF DATA STRUCTURES			
1.	Discuss various the asymptotic notations used for best case average case and worst case analysis of algorithms	Understand	5
2.	Explain Performance Analysis in Detail.	Understand	5
3.	Explain time and space complexities in detail	Understand	5
4.	Explain the different operations on singly linked list.	Remember	6
5.	Explain concatenation of singly linked lists	Apply	6
6.	Explain circular linked list operations	Remember	6
7.	Explain doubly linked list operations	Remember	6
8.	List the advantages and disadvantages of doubly linked list over singly linked list? Explain the applications of doubly linked lists	Understand	6
9.	Write an algorithm to insert and delete a key in a circular queue	Remember	6
10	Write an algorithm for basic operations on Stack and queue	Remember	1
11	Explain DEQUEUE ADT and its operations	Remember	6
12	Implement a queue using two stacks.	Apply	6
13	Implement a Circular queue of integer of user specified size and write the functions for initialize () enqueue () and dequeue()	Understand	6
14	Discuss max priority queue ADT with examples	Remember	6
15	List the advantages of priority queue? Explain the implementation of Priority Queue.?	Understand	6

PART – C (PROBLEM SOLVING AND CRITICAL THINKING QUESTIONS)

S. No	Question	Blooms Taxonomy Level	Course Outcome
UNIT – I INTRODUCTION			
1.	$F(n)=3n^2-n+4$ show that $f(n)=O(n^2)$	Apply	5
2.	$F(n)=5n^2+10n$ convert this to $\Omega()$ notation	Apply	5
3.	$F(n)=\sqrt{n}$ and $g(n)=\log n$, show that $f(n)+g(n)=O(\sqrt{n})$	Apply	5
4	Given a Singly linked list with each node containing either 0, 1 or 2. Write code to sort the list. Input: 1 -> 1 -> 2 -> 0 -> 2 -> 0 -> 1 -> 0 Output: 0 -> 0 -> 0 -> 1 -> 1 -> 1 -> 2 -> 2	Apply	7
5	Given two linked lists in a way such that the resultant must contain the elements alternatively from one list to other list. Input : LL1:1→2→3→4 LL2: 5→ 6→7 Output: 1→5→2→6→3→7→4	Apply	7
6	Given a queue of elements with priorities: 21, 13,17,10,7,11 do the following: a)Build the binary heap (draw the tree at each step) and show the corresponding array b>Delete the element with the highest priority, drawing the tree at each step of the deleting procedure c)Insert a new element with priority 15 and draw the tree at each step of the insertion procedure	Apply	6
7	Construct max heap for 150, 80, 40,30,10, 70, 110, 100, 20, 90, 60, 50,120,140,130	Apply	6

4.	<p>Find the output of following program print?</p> <pre>#include<stdio.h> void f(int *p, int *q) { p = q; *p = 2; } int i = 0, j = 1; int main() { f(&i, &j); printf("%d %d \n", i, j); getchar(); return 0; }</pre>	Apply	9
5.	<p>Consider the following C function:</p> <pre>int f(int n) { static int i = 1; if (n >= 5) return n; n = n+i; i++; return f(n); }</pre> <p>Find the value the value returned by f(1)?</p>	Apply	8
6.	<p>Find the output of the following fragment of C-program?</p> <pre>char c[] = "STUDENTS2016"; char *p=c; printf("%s", p + p[3] - p[1]) ;</pre>	Apply	9
7.	<p>Consider this C code to swap two integers and these five statements: the code</p> <pre>void swap(int *px, int *py) { *px = *px - *py; *py = *px + *py; *px = *py - *px; }</pre> <p>S1: will generate a compilation error S2: may generate a segmentation fault at runtime depending on the arguments passed S3: correctly implements the swap procedure for all input pointers referring to integers stored in memory locations accessible to the process S4: implements the swap program</p>	Apply	9
8.	<p>Consider the following C-function in which a[n] and b[m] are two sorted integer arrays and c[n + m] be another integer array.</p> <pre>void xyz(int a[], int b [], int c[]) { int i, j, k; i = j = k = 0; while ((i<m)) if (a[i] < b[j]) c[k++] = a[i++]; else c[k++] = b[j++]; }</pre> <p>Find the condition(s) which hold(s) after the termination of the while loop?</p>	Apply	8
9.	<p>Consider the following declaration of a 'two-dimensional array in C:</p>	Apply	9

	<pre>char a[100][100];</pre> <p>Assuming that the main memory is byte-addressable and that the array is stored starting from memory address 0, what is the address of a[40][50]?</p>		
10.	<p>Find the value of j at the end of the execution of the following C program.</p> <pre>int incr (int i) { static int count = 0; count = count + i; return (count); } main () { int i,j; for (i = 0; i <=4; i++) j = incr(i); }</pre>	Apply	8

PART – A (SHORT ANSWER QUESTIONS)

S. No	Question	Blooms Taxonomy Level	Course Outcome
UNIT – II CONTROL STRUCTURES, ARRAYS AND STRINGS			
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	3
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	3
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	3
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</pre>	Understand	3

	z = 2;		
5.	Find the output of the following code? <pre>int main() { int i = 1; for(; i < 4; i++); printf("%d", i); return 0; }</pre>	Understand	3
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	3
7.	Find the output of the following code? <pre>int main() { int a; for(a = 5; --a;) printf("%d", a); return 0; }</pre>	Understand	3
8.	State the difference between entry controlled and exit controlled loop with example?	Remember	3
9.	Write the usage of break and continue statement with example?	Remember	3
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	3
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	3
12.	Find the output of the following code? <pre>void main() { int choice = 3; switch(choice)</pre>		3

	<pre> { default: printf("default"); case 1: printf("choice 1"); break; case 2: printf("choice 2"); break; } } </pre>		
13.	Find the output of the following code? <pre> void main() { char c = 125; do printf("%d", c); while(c++); } </pre>	Understand	3
14.	Find the output of the following code? <pre> void main() { for(;;) { printf("%d", 10); } } </pre>	Understand	3
15.	Find the output of the following code? <pre> void main() { printf("hi!"); if !(0) printf("bye"); } </pre>	Understand	3
16.	Find the output of the following code? <pre> void main() { int a =1; if(a) printf("test"); else ; printf("again"); } </pre>	Understand	3
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	3
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	3
19.	Find the output of the following code? <pre> void main() { int i; for(i = 2; i += 2; i <= 9; i +=2) </pre>	Understand	3

	<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	3
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	3
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	3
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	3
24.	<p>State the rule that determines the order in which initial values are assigned to multi dimensional array elements?</p>	Remember	4
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	4
26.	<p>State which of the following is the correct syntax for initialization of two-dimensional array?</p> <ol style="list-style-type: none"> table[2][3]={0,0,0,1,1,1}; 	Remember	4

	b. <code>table[2][3]={ {0,0,0} {1,1,1} };</code> c. <code>table[2][3]={0,1},{0,1},{0,1};</code>		
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	4
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	4
29.	Write the output of the following code? <pre>void main() { int xxx[10] = {5}; printf("%3d%3d", xxx[1], xxx[9]); }</pre>	Understand	4
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	4
31.	Distinguish Lvalue and Rvalue of an array element?	Remember	4
32.	Is it possible to pass an entire array to a function as an argument? State with an example?	Remember	4
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	4
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	4
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	4

	}		
36.	State the correct syntax for copying a string S1 into S2?	Remember	7
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	6
38.	Examine the code and identify the line no containing error? int a[10]; //line 1 int *p; //line 2 p=a; //line 3 a=p; //line 4	Remember	7
39.	Compare the following two strings using strcmp() function and display its return value? char x[5] = "ABCD"; char y[5] = "abcd";	Remember	7
40.	Identify the string function which is available in <string.h> to find the sub-string in the main string?	Understand	6
41.	State various string manipulation functions in C?	Understand	6

PART – B (LONG ANSWER QUESTIONS)

S. No	Question	Blooms Taxonomy Level	Course Outcome
UNIT – II CONTROL STRUCTURES, ARRAYS AND STRINGS			
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?	Understand	3
2.	Write a program to find the number of and sum of all integers greater than 100 and less than 200 that are divisible by 7?	Apply	3
3.	Write a C program to display your branch name based upon the branch code using switch statement?	Understand	3
4.	Admission to a professional course is subject to the following conditions: a. Marks in Mathematics >= 60 b. Marks in Physics >= 50 c. Marks in Chemistry >= 40 d. Total in all three subjects >= 200 e. 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.	Apply	3
5.	Write a C program to compute the real roots of a quadratic equation $ax^2 + bx + c = 0$ The roots are given by the equations _____ _____ 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: a. No solution, if both a and b are zero b. There is only one root, if a=0 c. There are no real roots, if $b^2 - 4ac$ is negative d. Otherwise, there are two real roots Write a C program to test all the above conditions.	Apply	3
6.	Calculate the LCM and GCD of two 2- digit numbers?	Remember	
7.	Write a C program to calculate commission for the input value of sales amount. Commission is calculated as per the following rules: a. Commission is nil for sales amount Rs 5000/.	Apply	

	b. Commission is 2% for sales when sales amount is greater than 5000 and less than equal to 10000. c. Commission is 5% for sales amount greater than 10000.																						
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. <table><tr><td><u>Characters</u></td><td><u>ASCII values</u></td></tr><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></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	Remember											
<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.	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.	Apply																					
10.	Write a C program to produce the following output? 1 3 5 7 9 11 13 15 17 19	Apply																					
11.	Write a C program to display N th Fibonacci number.	Understand																					
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	Apply																					
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 next pair of numbers of without computing the sum. Are any values of x also illegal? If so, test for them too.	Apply																					
14.	Write a C program to print Armstrong numbers between 1 to n where n value is entered by the user. Armstrong number is defined as the sum of cubes of individual digits of a number. e.g. $371 = 3^3 + 7^3 + 1^3$	Apply																					
15.	Write a C program to generate all prime numbers between 1 and n, where n value is supplied by the user.	Apply																					
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. <table><tr><td colspan="5">1</td></tr><tr><td colspan="2">1</td><td colspan="3">1</td></tr><tr><td>1</td><td>2</td><td>1</td><td colspan="2">1</td></tr><tr><td>1</td><td>3</td><td>3</td><td>1</td><td>1</td></tr></table>	1					1		1			1	2	1	1		1	3	3	1	1	Apply	
1																							
1		1																					
1	2	1	1																				
1	3	3	1	1																			
17.	Write a C program to print first n lines of Floyd's Triangle. 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15	Apply																					
18.	Write a C program to print the following series $1/1! + 2/2! + 3/3! + $	Apply	3																				
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	Remember	3																				

	program should also count and display the number of such values.		
20.	Write a C program to produce the following form of Floyd's triangle 1 2 3 4 5 6 7 8 9 10	Apply	3
21.	Write C programs for the following: a. Find the largest and smallest number among a list of integers. b. Read a list of elements into an array and print the reverse of the list.	Apply	3
22.	Write C programs for the following: a. Read two matrices and find the addition and multiplication of two matrices. b. 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	3
23.	Write a C program to store numbers into an array and find the frequency of a particular number in array and print it.	Apply	3
24.	Write a C program to swap the K^{th} and $(K+1)^{\text{th}}$ elements in an integer array where K is given by the user.	Apply	3
25.	Write a C program to merge two sorted arrays into a third array.	Apply	3
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.	Apply	3
27.	Write a C program to print a given number into words. [Hint: 123 should be displayed as one two three]	Apply	3
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?	Apply	3
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.	Apply	6
30.	Write a C program to a. Remove blank spaces from a string. b. Capitalize all the letters of a string.	Apply	3

PART – C (PROBLEM SOLVING AND CRITICAL THINKING QUESTIONS)

S. No	Question	Blooms Taxonomy Level	Course Outcome
UNIT – II CONTROL STRUCTURES, ARRAYS AND STRINGS			
1.	<pre>void main() { int i = 5, sum = 0; for(i; i; i+5) sum = sum + i; printf("Sum = %d", sum); }</pre> Analyze the above code and predict the output from printf() statement.	Apply	9

2.	<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> <p>Evaluate the final value of i, j, k from the above code?</p>	Apply	8
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	9
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>	Apply	8
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>	Apply	9
6.	<pre> void g(int x[10], int p) { x[p] = p; } </pre>	Apply	8

	<pre> 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]); } </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>	Apply	9
8.	<pre> for(putchar('C');putchar('A');putchar('R')) putchar('T'); </pre> <p>Predict the output of the above code.</p>	Apply	9

PART – A (SHORT ANSWER QUESTIONS)

S. No	Question	Blooms Taxonomy Level	Course Outcome
UNIT – III			
FUNCTIONS AND POINTERS			
1.	State the advantage of user defined functions?	Remember	3, 4
2.	State various types of functions used in C?	Understand	4
3.	State the difference between actual and formal parameters?	Understand	3
4.	Write the need for a function prototype with an example?	Remember	3
5.	State the various types of functions depending upon categories of arguments and return statements with example?	Remember	3
6.	Define a recursive function with an example?	Remember	4
7.	State the advantages and disadvantages of recursion?	Remember	4
8.	Find the output of the following code? <pre> void main () { static int v = 5; printf ("%d\t", v--); if(v) main(); } </pre>	Remember	4
9.	Write the default return type for a function with an example?	Remember	3
10.	Distinguish between the following: a. Automatic and static variables b. Scope and visibility of variables	Understand	3
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	3
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	3
13.	Find errors if any, in the following function calls: a. xyz (int x, int y);	Understand	3

	b. xyz () + xyz (); c. xyz (void);		
14.	Find the output of the following code? <pre> 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); } </pre>	Understand	3
15.	Find the output of the following code? <pre> 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); } </pre>	Understand	3
CIE – II			
16.	State the reasons that is likely to happen when the following situations are encountered in a program: <ol style="list-style-type: none"> Actual parameters are less than the formal arguments in a function. 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. 	Understand	3
17.	State the need for dynamic memory allocation and how does it help in building complex programs?	Understand	3
18.	Write the principal difference between the functions malloc() and calloc()?	Understand	3
19.	List out the dynamic memory allocation functions and write its general syntax?	Remember	3, 4
20.	Write the usage of realloc () and free () function with example?	Remember	3, 4
21.	Define scope of a variable?	Remember	3, 4
22.	Identify the storage class which allows the data to be stored in CPU?	Remember	4
23.	Find errors if any: <pre> void main () { extern int x = 10; } </pre>	Understand	4

	<pre> printf ("%d", x); } </pre>		
24.	<p>Find the output of the following code?</p> <pre> extern int x; int x = 25; void main () { extern int x; printf ("%d", x); } </pre>	Understand	4
25.	<p>Find the output of the following code?</p> <pre> void main() { static int i=5; if(--i) { main(); printf("%d\t",i); } } </pre>	Understand	4
26.	<p>Find the output of the following code?</p> <pre> f(int i, int j) { i = i+j; printf("%5d%5d", i, j); } void main() { f(1,2); f(2,3); } </pre>	Understand	4
27.	In C, if you pass an array as an argument to a function, predict what actually gets passed?	Understand	4
28.	<p>Find the output of the following code?</p> <pre> void fun() { static int s; s = s+ 2; printf("s = %d", s); } void main() { fun(); fun(); } </pre>	Remember	4
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	4
30.	<p>Find the output of the following code?</p> <pre> int funct(char ch) </pre>	Understand	4

	<pre> { ch=ch+1; return ch; } void main() { int a=127; printf("%d %d", a, funct(a)); } </pre>		
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	4
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	4
33.	<p>Write the output of the following code?</p> <pre> void print(int *); void print(int *); void main() { int x=100; print(&x); } void print(int *a) { printf("%d",*a); } </pre>	Understand	4
34.	<p>Write the output of the following code?</p> <pre> int increment(int i) { static int count =0; count = count + 1; return(count); } </pre>	Understand	4

	<pre> void main() { int i,j; for (i=0;i<=4;i++) j = increment(i); printf("%5d", j); } </pre>		
35.	Write the advantages of pointer?	Remember	5
36.	State how a pointer variable can be declared and accessed with an example?	Understand	7
37.	Write the meaning of chain of pointers with an example?	Remember	7
38.	Write the disadvantages of pointers?	Remember	7
39.	State the arithmetic operations which are allowed in pointers?	Remember	7
40.	Write the use of NULL pointer to avoid dangling state?	Understand	7
41.	Find the output of the following? <pre> void main() { int n[3][2] = {3, 6, 9, 12, 15, 18}; printf("%2d%2d", *(n + 1)[1], **(n + 2)); } </pre>	Remember	7
42.	Find the value of *y, *(y + 1) for the following program fragment: <pre> char x [] = "Life is beautiful"; char *y = &x [3]; </pre>	Remember	7
43.	Given int x = 10, y = 10; int *p1 = &x, *p2 = &y; Find the value of each of the following expressions: a. (*p1)++ b. -- (*p2)	Understand	7
44.	Identify the correct expression for declaring a pointer to a function? a. int (*p) (void); b. int *p (void);	Understand	7
45.	Find the output of the following segment? <pre> int m[2]; *(m + 1) = 100; *m = *(m + 1); printf ("%d", m [0]); </pre>	Understand	7
46.	Use void pointer to print the value of x and ch? <pre> int *ip, x = 5; char *cp, ch = 'a'; void *vp; </pre>	Remember	7
47.	Write the procedure for swapping two strings using pointers?	Remember	5
48.	Write the significance of void pointer?	Remember	7
49.	State the role of preprocessor?	Remember	2
50.	List out the categories of preprocessor directives?	Remember	2
51.	Write the different forms of macro substitution with example?	Remember	2
52.	State different forms of file inclusion with example?	Remember	2
53.	List out miscellaneous preprocessor directives with example?	Remember	2
54.	Write the advantages of macro definitions in a program?	Remember	2
55.	The value of a macro name cannot be changed during running of a program. Write your comments?	Understand	3
56.	Write the need for conditional compilation and how does it help a programmer?	Remember	2
57.	Distinguish between #ifdef and #if directives?	Remember	2
58.	Define a macro and state how it is different from a C variable name?	Remember	2
59.	List out the precautions one should take when using macros with argument?	Remember	2
60.	Enumerate the differences between functions and parameterized macros?	Understand	3

PART – B (LONG ANSWER QUESTIONS)

S. No	Question	Blooms Taxonomy Level	Course Outcome
UNIT – III FUNCTIONS AND POINTERS			
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	Apply	3
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	Apply	3
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	Apply	3
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.	Apply	4
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]	Apply	4
CIE - II			
6.	List out the different types of storage classes with valid example?	Apply	4
7.	Compare and Contrast iteration versus recursion with suitable example?	Apply	6
8.	Explain different types of preprocessor directives?	Apply	6
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]	Apply	4
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]	Apply	4
11.	Distinguish between the following: a. Actual and formal arguments b. Scope and visibility of variables	Apply	3
12.	Write a C program using function that reads an array of integers and reverses the elements of an array using pointers?	Apply	7
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?	Apply	7
14.	List out the advantages of using pointers and explain generic (void) pointers with a suitable example?	Apply	7
15.	Write a C program that accepts a set of 5 names using array of pointers concept and displays them?	Apply	7
16.	Explain in detail about dynamic memory allocation functions like malloc(), calloc(), realloc() and free() with suitable example?	Apply	5
17.	Write a C program to pass a multi-dimensional array to a function containing marks of students and display it on the screen?	Apply	3
18.	Write a C program to read a list of N integers and sort it using pointers. [hint: use any sorting technique]	Apply	6

19.	Write a C program to read a string and find the number of vowels, consonants, digits and white spaces in that string?	Apply	6
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 and count the number of dissimilar characters.	Apply	4
21.	Write a C program to a. Add two numbers using pointers. b. Swap two numbers using pointers.	Apply	7
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.	Apply	7
23.	Explain the following: a. Process of pointer initialization with an example? b. Distinguish between (*m)[5] and *m[5]?	Apply	7
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?	Apply	7
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	Apply	7

PART – C (PROBLEM SOLVING AND CRITICAL THINKING QUESTIONS)

S. No	Question	Blooms Taxonomy Level	Course Outcome
UNIT – III FUNCTIONS AND POINTERS			
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); }	Apply	9
2.	Analyze the following program and identify the error in the program? void main() { char ch = ‘c’; char c = ‘a’; char *const ptr = &ch; ptr = &c; }	Apply	9

3.	Analyze the following program and find the output of the program? <pre> int fun(int a, int b) { printf("\n a = %d", a); printf("\n b = %d", b); } void main() { int(*fptr)(int,int); fptr = func; func(2, 3); fptr(2,3); } </pre>	Apply	8
4.	Analyze the following program and find the output of the program? <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>	Apply	9
CIE - II			
5.	Analyze the following program and find the output of the program? <pre> void main() { char s1[7] = "1234", *p; p = s1 + 2; *p = '\0'; printf("%s", s1); } </pre>	Apply	9
6.	Consider the following three C functions :, <pre> [PI] 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; } </pre>	Apply	9

	<pre> 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 		
7.	<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>	Apply	8
8.	<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>	Apply	8
9.	<p>Consider the following C program</p> <pre> main() { int x, y, m, n; scanf ("%d %d", &x, &y); /* x > 0 and y > 0 */ m = x; n = y; } </pre>	Apply	9

	<pre> while (m != n) { if(m>n) m = m - n; else n = n - m; } printf("%d", n); } </pre> <p>The program computes</p> <ol style="list-style-type: none"> x+y using repeated subtraction x mod y using repeated subtraction the greatest common divisor of x and y the least common multiple of x and y 		
10.	<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>	Apply	8

PART – A (SHORT ANSWER QUESTIONS)

S. No	Question	Blooms Taxonomy Level	Course Outcome
UNIT – IV STRUCTURES AND UNIONS			
1.	Define a structure and state how the members of a structure are accessed with example?	Understand	7
2.	Write the major differences between arrays and structures?	Remember	7
3.	Write an example of nested structure?	Remember	7
4.	State the difference between a structure and union?	Remember	7
5.	Write an example of array of structures?	Remember	7
6.	Write the general format of sending a copy of a structure to the called function?	Remember	7
7.	The uninitialized integer data type of a structure contains which of the following default values a. Garbage b. Zero c. One	Remember	7
8.	Identify the following expressions which are correct for accessing the 'num' variable value of the i th element of a structure array 'student' a. student[i].num b. student.num[i] c. student[i]->num	Remember	7
9.	Find the output of the following? struct { int i;	Remember	7

	<pre> float f; }var; void main() { var.i=5; var.f=9.76723; printf("%d %.2f",var.i,var.f); } </pre>		
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>	Remember	7
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>	Remember	7
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	7
13.	Write an example for enumerated data type?	Remember	7
14.	State the default starting value of enumerated set?	Understand	7
15.	Write the usage of typedef with example?	Remember	7
16.	Write the value of tulip from the following enumerated flowers? enum flowers{rose, lily = 5, lotus, tulip, sunflower};	Understand	7
17.	State the operator which connects the structure name to its member name?	Understand	7
18.	Size of an 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	Understand	7
19.	Find the size of the following union declaration?	Understand	7

	<pre>union Temp { double a; int b[10]; char c; }u;</pre> (Assuming size of double = 8, size of int = 4, size of char = 1)		
20.	Bit fields can only be declared as part of a structure a. false b. true c. can't say d. none	Understand	7

PART – B (LONG ANSWER QUESTIONS)

S. No	Question	Blooms Taxonomy Level	Course Outcome
UNIT – IV STRUCTURES AND UNIONS			
1.	Write a C program to read your full name and date of birth and display the same using the concept of nested structure.	Apply	7
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.	Apply	7
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.	Apply	7
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.	Apply	7
5.	Consider the declaration of the structure <pre>typedef struct { char x; char *y; int z[20]; } status;</pre> 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];	Apply	7
6.	Explain the following with suitable example: a. Nested Structures b. Array of structures	Understand	7
7.	Explain the following with suitable example: a. self referential structures b. enumerated types	Understand	7
8.	Write a C program to pass a copy of the entire structure named stores	Apply	7

	containing members name, price and quantity to a function?		
9.	Write the usage of the following: a. Unions b. Bit fields	Understand	7
10.	Explain with examples, the different ways of assigning values to structure members?	Understand	7
11.	Explain three different approaches that can be used to pass structures as function arguments?	Apply	7
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.	Apply	7
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	Apply	7
14.	Define a structure named census with the following 3 members: a. A character array city[] to store names. b. A long integer to store population of the city. c. A float member to store the literacy level. Write a program to do the following: 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.	Apply	7
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.	Apply	7
16.	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 average.	Apply	7
17.	Define a 'slack byte'? Explain how it affects the implementation of structures?	Apply	7
18.	Explain the meaning and purpose of the following: a. struct keyword b. typedef keyword c. sizeof operator	Apply	
19.	Compare and contrast structures and unions?	Understand	7
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.	Apply	7
21.	Given the following structure and variable definitions, struct customer { char lastName[15]; char firstName[15]; int customerNumber; struct {	Apply	7

	<pre>char address[50]; char city[15]; char state[3]; char zipCode[6]; } personal; } customerRecord, *customerPtr; customerPtr = &customerRecord;</pre> <p>Write an expression that can be used to access the structure member in each of the following parts:</p> <p>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.</p>		
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.	Apply	7
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).	Apply	7
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.	Apply	7

PART – C (PROBLEM SOLVING AND CRITICAL THINKING QUESTIONS)

S. No	Question	Blooms Taxonomy Level	Course Outcome
UNIT – IV STRUCTURES AND UNIONS			
1.	<p>Analyze the following program and find out the error in the program?</p> <pre>#include<stdio.h> int main() { struct a { float category:5; char scheme:4; }; printf("size=%d", sizeof(struct a)); return 0; }</pre>	Apply	8

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>	Apply	9
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>	Apply	8
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>	Apply	9
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>	Apply	8
6.	Analyze the code and identify the statements which are correct in the following program? <pre>#include<stdio.h> int main()</pre>	Apply	9

	<pre> { 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 initialize char ch[] of u2 '.' Operator should be used. d. The code causes an error 'Declaration syntax error'</p>		
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PART – A (SHORT ANSWER QUESTIONS)

S. No	Question	Blooms Taxonomy Level	Course Outcome
UNIT – V FILES			
1.	Write the basic operations of a file?	Understand	7
2.	Write the various text file opening modes?	Understand	7
3.	State the various types of status enquiry library functions in C?	Understand	7
4.	Write the syntax and usage of ftell()?	Remember	7
5.	Write the purpose of fseek() with example?	Remember	7
6.	Write the syntax and usage of rewind()?	Remember	7
7.	Find the output of the following <pre> int main() { FILE *fp = stdin; int n; fprintf(fp, "%d", 45); } </pre>	Understand	7
8.	If there is any error while opening a file, fopen() will return? <ol style="list-style-type: none"> Nothing EOF NULL Depends on compiler 	Understand	7
9.	Find the meaning of 'a' in the following operation? fp = fopen("sample.txt", "a");	Understand	7
10.	Identify which is correct about a FILE <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 	Understand	7
11.	Predict the output of this code? <pre> #include <stdio.h> int main() { FILE *fp = stdout; stderr = fp; fprintf(stderr, "%s", "hello"); } </pre>	Understand	7
12.	Find the output of this code?	Understand	7

	<pre>#include <stdio.h> #include <stdlib.h> int main() { FILE *fp = stdout; int n; fprintf(fp, "%d", 45); }</pre>		
13.	Find which is true about stdout, stdin and stderr? <ul style="list-style-type: none"> a. File pointers b. File descriptors c. Streams d. Structure 	Understand	7
14.	Predict the output of this code? <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	7
15.	Find the content of 'file.c' after executing the following program? <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	7
16.	If the file 'source.txt' contains a line "Be my friend", predict the output of below program? <pre>#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; }</pre>	Understand	7
17.	Identify the error in the program? <pre>#include<stdio.h> #include<stdlib.h> int main() { unsigned char; FILE *fp;</pre>	Understand	7

	<pre> fp=fopen("trial", "r"); if(!fp) { printf("Unable to open file"); exit(1); } fclose(fp); return 0; } </pre>		
18.	Identify which is true about fseek() ? fseek() should be preferred over rewind() mainly because a. rewind() doesn't work for empty files b. rewind() may fail for large files c. In rewind, there is no way to check if the operations completed successfully d. All of the above	Understand	7
19.	When fopen() is not able to open a file, it returns a. EOF b. NULL c. Runtime Error d. Compiler Dependent	Understand	7
20.	Identify which of the following is true about FILE *fp a. FILE is a keyword in C for representing files and fp is a variable of FILE type. b. FILE is a structure and fp is a pointer to the structure of FILE type c. FILE is a stream d. FILE is a buffered stream	Understand	7

PART – B (LONG ANSWER QUESTIONS)

S. No	Question	Blooms Taxonomy Level	Course Outcome																
UNIT – V FILES																			
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?	Apply	7																
2.	Explain the following functions with suitable example: a. ftell() b. fseek() c. rewind()	Understand	7																
3.	Write a C program to read a text file "sample.txt" and reverse N character in a file.	Apply	7																
4.	Explain the following file I/O functions with example: a. fopen() b. fclose() c. fread() d. fwrite()	Understand	7																
5.	Write a C program to open a file names INVENTORY and store in it the following data <table border="1" style="width: 100%; border-collapse: collapse;"> <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> Read the data from the INVENTORY file and display the inventory table	Item	number	price	quantity	Printer	P100	7500	10	Scanner	S200	5500	5	Hard disk	H300	4500	8	Apply	7
Item	number	price	quantity																
Printer	P100	7500	10																
Scanner	S200	5500	5																
Hard disk	H300	4500	8																

	with the value of each item. [Hint: value = price * quantity and use fprintf() and fscanf() functions]		
6.	Write a C program to capitalize first letter of every word in a file.	Apply	7
7.	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.	Apply	7
8.	Write a C program to count chars, spaces, tabs and newlines in a file.	Apply	7
9.	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.	Apply	7
10.	Write a C program count the total number of characters inside the source file.	Apply	7

PART – C (PROBLEM SOLVING AND CRITICAL THINKING QUESTIONS)

S. No	Question	Blooms Taxonomy Level	Course Outcome
UNIT – V FILES			
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 empty file 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	Apply	8
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.	Apply	9
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	8
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	8

Prepared by: Ms. B Padmaja, Associate professor, CSE
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HOD, CSE