PART – A (SHORT ANSWER QUESTIONS)

S. No	Question	Blooms Taxonomy Level	Course Outcome
	UNIT – I **INTRODUCTION TO C LANGUAGE**		
1	**List** the two major components of a computer system?	Remember	1
2	**Identify** the steps in creating and running a C program?	Remember	2
3	**State** the keyword which helps to retain the highest accuracy of data?	Remember	2
4	**Write** the various classes of data types ANSI C supports?	Remember	4

5	**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	3

6	**Find** the value of x in the following expression?	Remember	3

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	x = 3 / 2 % 6 – 3 / 9;		
7	**Explain** the output of following statement? printf("%s","IARE-2015"+5);	Understand	3
8	**Write** the size and range of the basic data types?	Remember	3

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

10	Take x = 0, y = 0 and z = 1. **Find** the value of x, y, and z after executing the following code?
	  if(x)
	    if(y)
	      z = 3;
	   else
	      z = 2;
		Understand	3

11	**Find** the output of the following code?
	void main()
	{
	    double k=0;
	    for(k = 0.0, k < 3.0; k++)
	        printf("Hello");
	}
		Remember	3

12	**Solve** the expression and find output of the following code?
	void main()
	{
	    int x = !5 – 4 + 2 * 5;
	    printf("%d", x);
	}
		Remember	3

13	**Write** the basic escape sequence characters and its meaning with example?	Remember	3

14	**Find** the output of c, d, e and f in the below code?
	  float c = 15/10.0;
	  int d = 15/10;
	  float e = 15/10;
	  float f = 15.0/10.0;
		Remember	3

15	**Find** the output of the following code?
	  int main()
	  {
	    printf("%d"+1, 123);
	    return 0;
	  }
		Understand	3

16	**Find** the output of the following code?
	  int main()
	  {
	    printf("%d", printf("Hi!") + printf("Bye"));
	    return 0;
	  }
		Remember	3

17	**Find** the output of the following code?
	  int main()
	  {
	    printf("Work" "Hard");
	    return 0;
	  }
		Understand	3

18	**Find** the output of the following code? int main()	Understand	3

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	```\n{\n int v = 10;\n printf("%d", v++, "%d", v--);\n return 0;\n}\n```		
19	**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. ```\nint main()\n{\n int v = 5, n;\n printf("%d",scanf("%d%d", &v, &n));\n return 0;\n}\n```	Understand	3
20	**Find** the output of the following code? ```\nint main()\n{\n int a = 500, b = 100, c = 30, d = 40, e = 19;\n a += b -= c *= d /= e %= 5;\n printf("%2d%2d%2d%2d%2d", a, b, c, d, e);\n return 0;\n}\n```	Understand	3
21	**Find** the value of x, y, z for a = 9, b = 12, c = 3 (assume all are declared as float data type) a. $x = a - b / 3 + c * 2 - 1;$ b. $y = a - b / (3 + c) * (2 - 1);$ c. $z = a - (b / (3 + c) * 2) - 1;$	Understand	3
22	**Find** the output of the following code? ```\nint main()\n{\n int a;\n a = 015 + 0x15 + 5;\n printf("%d", a);\n return 0;\n}\n```	Understand	3
23	**Find** the output of the following code? ```\nint main()\n{\n printf("%2d%2d%2d", sizeof(3.14), sizeof(3.14f), sizeof(3.14L));\n return 0;\n}\n```	Understand	3
24	**Find** the output of the following code? ```\nint main()\n{\n int a = 5;\n a = ++i + ++i + ++i;\n printf("%d", a);\n return 0;\n}\n```	Understand	3
25	**Find** the output of the following code? ```\nint main()\n{\n int i = 1;\n for(; i < 4; i++);\n printf("%d", i);\n return 0;\n}\n```	Understand	3
26	**Find** the output of the following code?	Understand	3

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| | ```
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;
}
``` | | |
| 27 | **Find** the output of the following code?<br>```
int main()
{
    int a;
    for(a = 5; --a;)
        printf("%d", a);
    return 0;
}
``` | Understand | 3 |
| 28 | **State** the difference between entry controlled and exit controlled loop with example? | Remember | 3 |
| 29 | **Write** the usage of break and continue statement with example? | Remember | 3 |
| 30 | **Find** the output of the following code?<br>```
int main()
{
    int a = 1, b = 2, c = 3, d = 4, e;
    if(e = (a & b | c ^ d))
        printf("%d", e);
    return 0;
}
``` | Understand | 3 |
| 31 | **Find** the output of the following code?<br>```
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);
}
``` | Understand | 3 |
| 32 | **Find** the output of the following code?<br>```
void main()
{
    int choice = 3;
    switch(choice)
    {
        default: printf("default");
        case 1: printf("choice 1"); break;
        case 2: printf("choice 2"); break;
    }
}
``` | | 3 |
| 33 | **Find** the output of the following code?<br>```
void main()
{
    char c = 125;
    do
        printf("%d", c);
``` | Understand | 3 |

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	while(c++); }		

34	**Find** the output of the following code?
	　void main()
	　{
	　　for(;;)
	　　{
	　　　printf("%d", 10);
	　　}
	　}
		Understand	3

35	**Find** the output of the following code?
	　void main()
	　{
	　　printf("hi!");
	　　if !(0)
	　　　printf("bye");
	　}
		Understand	3

36	**Find** the output of the following code?
	　void main()
	　{
	　　int a =1;
	　　if(a)
	　　　printf("test");
	　　else ;
	　　　printf("again");
	　}
		Understand	3

37	**Find** the output of the following code?
	　void main()
	　{
	　　int i =1;
	　　if(i++, ++i, i--, --i)
	　　　printf("%d\n", i);
	　}
		Understand	3

38	**Find** the output of the following code?
	　void main()
	　{
	　　float i;
	　　for(i = 0.1;i < 0.4; i += 0.1)
	　　　printf("%.1f\n", i);
	　}
		Understand	3

39	**Find** the output of the following code?
	　void main()
	　{
	　　int i;
	　　for(i = 2;i += 2; i <= 9; i +=2)
	　　　printf("%d\n", i);
	　}
		Understand	3

40	**Find** the output of the following code?
	　void main()
	　{
	　　int i = 3;
	　　for(i--; i < 7; i = 7)
	　　　printf("%d", i++);
	　}
		Understand	3

UNIT – II **FUNCTIONS AND ARRAYS**		
1	**State** the advantage of user defined functions?	Remember	3, 4
2	**Define** scope of a variable?	Remember	3, 4
3	**Identify** the storage class which allows the data to be stored in CPU?	Remember	4

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4	**Define** the role of preprocessor?	Remember	4
5	In C, if you pass an array as an argument to a function, **predict** what actually gets passed?	Understand	4
6	**Distinguish** Lvalue and Rvalue of an array element?	Remember	4

7	**Write** the output of the following code?
	
	``void main()
	{
	    int a[3][2] = {10. 20, 30, 40, 50, 60};
	    printf("%d", a[0][4]);
	}```
		Remember	4

8	**Find** the output of the following code?
	
	``void fun()
	{
	    static int s;
	    s = s+ 2;
	    printf("s = %d", s);
	}
	void main()
	{
	    fun();
	    fun();
	}```
		Remember	4

9	**State** which value is automatically assigned to those array elements that are not explicitly initialized with an example?	Remember	4
10	**State** the rule that determines the order in which initial values are assigned to multi dimensional array elements?	Remember	4
11	**State** which of the following is the correct syntax for the initialization of one-dimensional array? a. num[3]={0 0 0}; b. num[3]={0,0,0}; c. num[3]={0;0;0}; d. num[3]=0	Remember	4

12	**State** which of the following is the correct syntax for initialization of two-dimensional array?
	  a. table[2][3]={0,0,0,1,1,1};
	  b. table[2][3]={
	              {0,0,0}
	                {1,1,1}
	            };
	  c. table[2][3]={0,1},{0,1},{0,1};
		Remember	4

13	**State** which of the following multi-dimensional array declaration is correct for realizing a 2x3 matrix? a. int m[2][3] b. int m[3][2] c. int m[3],m[2]	Remember	4

14	**Write** the output of the following code?
	
	``void main()
	{
	    char a[8] = "my dear students";
	    printf("%s", a);
	}```
		Remember	4

15	**Find** the output of the following code?
	
	``void main()
	{
	    int a[][3] = {{1, 2}, {3, 4, 5}, {5}};
	    printf("%3d%3d%3d", sizeof(a), a[0][2], a[1][2]);```
		Understand	4

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	}		

16	**Write** the output of the following code?
	`void main()`
	`{`
	`    int xxx[10] = {5};`
	`    printf("%3d%3d", xxx[1], xxx[9]);`
	`}`
		Understand	4

17	**State** various types of functions used in C?	understand	4
18	**Write** the advantages of using functions?	Understand	3
19	**State** the difference between actual and formal parameters?	Understand	3
20	**Write** the need for a function prototype with an example?	Remember	3
21	**State** the various types of functions depending upon categories of arguments and return statements with example?	Remember	3
22	Is it possible to pass an entire array to a function as an argument? **State** with an example?	Remember	4
23	**Define** a recursive function with an example?	Remember	4
24	**Write** the default return type for a function with an example?	Remember	3
25	**Identify** the following which refers the region of a program where a variable is available for use?	Remember	3

26	**Find** the output of the following code?
	`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));`
	`}`
		Understand	4

27	**Find** the output of the following code?
	`int funct(char ch)`
	`{`
	`    ch=ch+1;`
	`    return ch;`
	`}`
	`void main()`
	`{`
	`    int a=127;`
	`    printf("%d %d", a, funct(a));`
	`}`
		Understand	4

28	**Write** the output of the following code?
	`int val;`
	`static int funct()`
	`{`
	`    return val*val;`
	`}`
	`void main()`
	`{`
	`    val=5;`
	`    funct();`
	`    val++;`
	`    printf("%d",funct());`
	`}`
		Understand	4

29	**Write** the output of the following code?
	`void main()`
	`{`
		Understand	4

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| | ```
    void funct1(void);
    void funct2(void);
    clrscr();
    funct1();
  }
 void funct1(void)
  {
      printf("Ocean of ");
      funct2();
  }
 void funct2(void)
  {
      printf("Knowledge");
  }
``` | | |
| 30 | **Write** the output of the following code?<br>```
  void print(int *);
  void print(int *);
  void main()
  {
      int x=100;
      print(&x);
  }
  void print(int *a)
  {
      printf("%d",*a);
  }
``` | Understand | 4 |
	UNIT – III **POINTERS AND STRINGS**		
1	**Write** the advantages of pointer?	Remember	5
2	**State** how a pointer variable can be declared and accessed with an example?	Understand	7
3	**Write** the meaning of chain of pointers with an example?	Remember	7
4	**State** call by value with an example?	Remember	7
5	**Write** the disadvantages of using pointers?	Remember	7
6	**State** the arithmetic operations which are allowed in pointers?	Remember	7
7	**Write** the use of NULL pointer to avoid dangling state?		7
8	**State** the correct syntax for copying a string S1 into S2?	Remember	7

9	**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
| 10 | **Find** the output of the following?<br>```
void main()
{
    int n[3][2] = {3, 6, 9, 12, 15, 18};
    printf("%2d%2d", *(n + 1)[1], **(n + 2));
}
``` | Remember | 7 |
| 11 | **Find** the value of *y, *(y + 1) for the following program fragment:
   char x [ ] = "Life is beautiful";
   char *y = &x [3]; | Remember | 7 |
| 12 | **Examine** the code and identify the line no containing error?
   int a[10]; //line 1
   int *p;   //line 2
   p=a;   //line 3 | Remember | 7 |

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	a=p; //line 4		
13	**Write** the significance of void pointer?	Remember	7
14	**Compare** the following two strings using strcmp() function and display its return value? char x[5] = "ABCD"; char y[5] = "abcd";	Remember	7
15	**Use** void pointer to print the value of x and ch? int *ip, x = 5; char *cp, ch = 'a'; void *vp;	Remember	7
16	**Identify** the string function which is available in <string.h> to find the sub-string in the main string?	Understand	6
17	**Write** the procedure for swapping two strings using pointers?	Remember	5
18	**Write** the differences between malloc() and calloc()?	Understand	5
19	**Write** the usage of realloc() to dynamically increase the size of an already allocated array?	Remember	5
20	**State** various string manipulation functions in C?	Understand	6
	UNIT – IV **ENUMERATED, STRUCTURE AND UNION TYPES**		
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	In C, **state** how many levels of nesting of structures are allowed?	Remember	7
8	The uninitialized integer data type of a structure contains which of the following default values a. Garbage b. Zero c. One	Remember	7
9	**Identify** the following expressions which are correct for accessing the 'num' variable value of the ith element of a structure array 'student' a. student[i].num b. student.num[i] c. student[i]->num	Remember	7

10	**Find** the output of the following?
	struct
	{
	   int i;
	      float f;
	}var;
	    void main()
	    {
	      var.i=5;
	      var.f=9.76723;
	     printf("%d %.2f",var.i,var.f);
	    }
		Remember	7

11	**Write** the output of the following?
	struct values
	  {
	     int i;
	     float f;
		Remember	7

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	``
	};
	void main()
	{
	    struct values var={555,67.05501};
	    printf("%2d %.2f",var.i,var.f);
	}
	``		

12	**Write** the output of the following?
	``
	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);
	}
	``
		Remember	7

13	**Write** the output of the following?
	``
	void main()
	{
	    struct employee
	    {
	        unsigned id: 8;
	        unsigned sex:1;
	        unsigned age:7;
	    };
	    struct employee emp1={203,1,23};
	    printf("%d\t%d\t%d",emp1.id,emp1.sex,emp1.age);
	}
	``
		Understand	7

14	**Write** an example for enumerated data type?	Remember	7
15	**State** the default starting value of enumerated set?	Understand	7
16	**Write** the usage of typedef with example?	Remember	7
17	**Write** the value of tulip from the following enumerated flowers? enum flowers{rose, lily = 5, lotus, tulip, sunflower);	Understand	7
18	**Write** the basic operations of a file?	Understand	7
19	**Write** the various text file opening modes?	Understand	7
20	**State** the various types of status enquiry library functions in C?	Understand	7
21	**Write** the syntax and usage of ftell()?	Remember	7
22	**Write** the purpose of fseek() with example?	Remember	7
23	**Write** the syntax and usage of rewind()?	Remember	7
24	**Write** the size of memory allocated by compiler to an union?	Remember	7

25	**Find** the output of the following
	``
	int main()
	{
	    FILE *fp = stdin;
	    int n;
	    fprintf(fp, "%d", 45);
	}
	``
		Understand	7

	UNIT – V **SEARCHING AND SORTING**		
1	**Write** the name of the data structure which is used in recursion internally?	Remember	8
2	**List** out the basic operations of stack?	Remember	8

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3	**Write** the basic requirement to search an element using binary search?	Remember	8
4	**List** out the sorting techniques which use "Divide and Conquer" policy?	Understand	8
5	**Find** the best data structure to store N number of dynamic records?	Understand	8
6	**Evaluate** the value of the following postfix expression? 10 2 8 * + 3 -	Remember	8
7	**List** out the memory allocation functions for single linked list?	Remember	8
8	**Translate** the given infix expression into its equivalent postfix expression? (A + B) – (C * D) / (F + G)	Understand	8
9	**Write** the name of the principle followed by Queue?	Remember	8
10	**Write** the stack overflow and underflow criteria?	Remember	8
11	**State** any two applications of Queue?	Remember	8
12	**State** the applications of Stack?	Remember	8
13	**Write** the problems associated with linear queue?	Understand	8
14	**Define** a node?	Remember	8
15	**Write** the basic operations associated with lists?	Remember	8
16	**Write** the applications of a linked list?	Remember	8
17	**State** the advantages of linked lists?	Understand	8
18	**Write** the disadvantages of linked lists?	Remember	8
19	**Write** the time complexity of bubble sort with an example?	Remember	8
20	**Write** the time complexity of linear and binary search with example?	Understand	8

PART – B (LONG ANSWER QUESTIONS)

S. No	Question	Blooms Taxonomy Level	Course Outcome
	UNIT – I **INTRODUCTION TO C LANGUAGE**		
1	**List** out the different operators used in C language? **Explain** any two types of operators with examples.	Understand	1
2	**List** out various steps involved in creating and running a program?		1
3	**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
4	**Explain various** types of computing environments to develop any executable code?	Understand	2
5	**Write** a C program to display your branch name based upon the branch code using switch statement?	Understand	3
6	**Calculate** the LCM and GCD of two 2- digit numbers?	Remember	3
7	**Write** a C program to identify an eligible voter as per Indian election process using nested – if statement?	Apply	3
8	**Write** a C program to calculate commission for the input value of sales amount. Commission is calculated as per the following rules: • 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.	Apply	3

9	A character is entered through keyboard. **Write** a C program to determine whether the character entered is a capital letter, a small case letter, a digit or a special symbol using if-else and switch case. The following table shows the range of ASCII values for various characters. Characters ASCII values A – Z 65 – 90 a – z 97 – 122 0 – 9 48 – 57 Special symbols 0 – 47, 58 – 64, 91 – 96, 123 - 127	Remember	3
10	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	3
11	**Write** a C program to produce the following output? 1 3 5 7 9 11 13 15 17 19	Apply	3
12	**Write** a C program to display Nth Fibonacci number.	Understand	3
13	**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	3
14	**Write** a C program to read in two numbers, x and n, and then compute the sum of this geometric progression $1+x+x^2+x^3+...x^n$. For example: if n is 3 and x is 5, then the program computes 1+5+25+125. Print x, n, the sum. Perform error checking. For example the formula does not make sense for negative Exponents – if n is less than 0. Have your program print an error message if n<0, then go back and read in the nest pair of numbers of without computing the sum. Are any values of x also illegal? If so, test for them too.	Apply	3
15	**Write** a C program for swapping of two given numbers using a temporary variable & without using temporary variable.	Understand	3
16	**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	3
17	**Write** a C program to generate all prime numbers between 1 and n, where n value is supplied by the user.	Apply	3
18	**Write** a C program to print first n lines of the Pascal's Triangle. Pascal's triangle is a triangular array of the binomial coefficients. 1 1 1 1 2 1 1 3 3 1	Apply	3
19	**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	3
20	**Write** a C program to print the following series 1/1! + 2/2! + 3/3! + ……………	Apply	3
UNIT – II **FUNCTIONS AND ARRAYS**		
1	**Write** C programs that uses both recursive and non-recursive functions: a. Find the sum of n natural numbers	Apply	3

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	b. Find the factorial of a given number		
2	**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
3	**Write** a C program to a. Convert decimal number to binary number b. Convert binary number to decimal number	Apply	3
4	**Write** C programs that uses both recursive and non-recursive functions: a. Find the Nth Fibonacci number b. Find the reverse of a number	Apply	3

5	**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
		Apply	4

6	**Write** a C program to store numbers into an array and find the frequency of a particular number in array and print it.	Understand	4
7	**Write** a C program to swap the Kth and (K+1)th elements in an integer array. K is given by the user.	Understand	4
8	**Write** a C program to a. Convert a Roman letter into its decimal equivalent. b. Find 2's complement of a binary number.	Understand	4
9	**Write** a C program to merge two sorted arrays into a third array.	Apply	4
10	**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	4
11	**Write** a user defined function to find middle number from the given 3 numbers?	Understand	4
12	A first year student is writing exam in 8 subjects. **Write** a C program to find the mean marks obtained by the student. [Hint: Negative marks are not allowed and if a student is absent, the marks is treated as 0]	Understand	4
13	**List** out the different types of storage classes with valid example?	Understand	4
14	**Compare** and **Contrast** iteration versus recursion with suitable example?	Understand	6
15	**Explain** different types of preprocessor directives?	Understand	6
16	**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	4
17	**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	4
18	**Write** a C program to print the tomorrow's date for the given today's date. [Hint: Suppose today's date is 31st March 2015, then the next day will be 1st April 2015]	Understand	4
19	**Write** a C program to print a given number into word for. [Hint: 123 should be displayed as one two three]	Understand	4
20	**Distinguish** between the following: a. Actual and formal arguments b. Scope and visibility of variables	Remember	3
	UNIT – III		

	POINTERS AND STRINGS		
1	**Write** a C program to read lines of text from the keyword and delete a word from the text. [Hint: The word may appear any number of times.	Remember	7
2	**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?	Remember	7
3	**Write** a C program using function that reads an array of integers and reverses the elements of an array using pointers?	Understand	7
4	**Write** a C program to read lines of text from the keyboard, count and display the occurrence of a particular word in that text?	Remember	7
5	**List** out the advantages of using pointers and **explain** generic (void) pointers with a suitable example?	Understand	7
6	**Write** a C program that accepts a set of 5 names using array of pointers concept and displays them?	Understand	7
7	**Explain** in detail about dynamic memory allocation functions like malloc(), calloc(), realloc() and free() with suitable example?	Remember	5
8	**Write** a C program to pass a multi-dimensional array to a function containing marks of students and display it on the screen?	Remember	3
9	**Write** a C program to read a list of N integers and sort it using pointers. [hint: use any sorting technique]	Understand	6
10	**Write** a C program to read a string and find the number of vowels, consonants, digits and white spaces in that string?	Understand	6
11	**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	6
12	**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
13	**Write** a C program to a. Add two numbers using pointers. b. Swap two numbers using pointers.	Apply	7
14	**Write** a C program to a. Remove blank spaces from a string. b. Capitalize all the letters of a string.	Understand	7
15	**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	7
16	Using pointers, **write** a function that receives a character string and a character as argument and deletes all occurrences of this character in the string. The function should return the corrected string with no holes.	Understand	7
17	**Explain** the following: a. Process of pointer initialization with an example? b. Distinguish between (*m)[5] and *m[5]?	Understand	7
18	**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	7

19	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	7

20	**Write** a C program, which reads your name from the keyboard and outputs a list of ASCII codes, which represent your name.	Understand	7

UNIT – IV
ENUMERATED, STRUCTURE AND UNION TYPES

1	**Write** a C program to read your full name and date of birth and display the same using the concept of nested structure.	Understand	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.	Understand	7
3	A marketing company is having 50 employees and it maintains employee records in terms of their empid, empname, desg, salary, quantity, salesamount. The company gives 10% hike in salary to the employees if their salesamount is more than 50000/-. **Write** a C program that displays the employee records who got hike in salary.	Understand	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.
		Understand	7

5	**Write** a C program to read a text file containing some paragraph. Use fseek() function and read the text after skipping 'n' characters from beginning of the file?	Understand	7

6	Consider the declaration of the structure
	    typedef struct
	   {
	      char x;
	      char *y;
	      int z[20];
	   } status;
	Discuss whether the following are valid, if invalid, give reason.
	      a. struct status s1;
	      b. struct status s2[25];
	      c. status s3;
	      d. status s4 [20];
		Understand	7

7	**Write** a C program to read a text file "sample.txt" and reverse N character in a file.	Understand	7

8	**Explain** the following with suitable example:
	    a. Nested Structures
	    b. Array of structures
		Understand	7

9	**Explain** the following functions with suitable example:
	    a. ftell()
	    b. fseek()
	    c. rewind()
		Understand	7

10	**Explain** the following with suitable example:
	    a. self referential structures
	    b. typedef
	    c. enumerated types
		Understand	7

11	**Write** a C program to pass a copy of the entire structure named stores containing members name, price and quantity to a function?	Apply	7

12	**Write** the usage of the following:
	    a. Unions
	    b. Bit fileds
	    c. The sizeof operator
		Understand	7

13	**Explain** with examples, the different ways of assigning values to structure members?	Understand	7

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14	**Explain** three different approaches that can be used to pass structures as function arguments?	Apply	7
15	**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
16	**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
17	**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
18	**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
19	**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
20	**Define** a 'slack byte'? **Explain** how it affects the implementation of structures?	Remember	7
	UNIT – V **SEARCHING AND SORTING**		
1	An array contains a list of integers 3, 13, 7, 26, 44, 23, 98, 57, 65, 24, 84, 37. **Write** a C program to sort the array elements using insertion sort and trace the steps?	Understand	8
2	**Write** a program to implement the basic operations of a stack using arrays.	Understand	8
3	**Write** a C program that searches a particular value in a stored array of integers using Binary Search technique.	Understand	8
4	**Write** a C program to implement the following operations using Singly linked list. a. Create a single linked list with N number of nodes. b. Insert a new node at the end. c. Delete a node from the beginning. d. Insert a node at the middle.	Understand	8
5	Appolo hospital maintains the patient details like patientid, patientname, diseasename and arrivaltime. The doctor calls the patient as per the arrival time order. **Write** a C program to do the following: a. Display the first 5 patient details. b. Add a new patient according to his/her arrival order.	Apply	8
6	**Compare** the time complexities of various sorting techniques?	Understand	8
7	**Write** a C program to evaluate the following postfix expression? 10 2 8 * + 3 -	Understand	8

8	**Write** a C program to reverse the elements stored in a single linked list.	Understand	8
9	**Compare** the time complexities of linear search and binary search with suitable examples?	Understand	8
10	**Write** a program to implement the basic operations of a queue using arrays.	Understand	8
11	**Write** a C program to convert an infix expression into postfix expression. a b c + d - * e % f /	Apply	8
12	**Write** a C program to combine two sorted lists to produce a third sorted lists which contains one occurrence of each of the following elements in the original list	Apply	8
13	**Write** a function that counts and returns the total number of nodes in a linked list?	Understand	8
14	**Write** a function that would traverse a linear singly linked list in reverse and write out the contents in reverse order?	Understand	8
15	**Write** a function that takes a specified node of a linked list and makes it as its last node?	Understand	8
16	**Write** an interactive C program to create linear linked lists of customer names and their telephone numbers .The program should be menu driven and include features for adding a new customer and deleting an existing customer?	Understand	8
17	**Write** a C program to explain bubble sort. Which type of technique does it belong?	Understand	8
18	**Write** an interactive C program to create linear linked lists of customer names and their telephone numbers .The program list is always maintained in the alphabetical order of customer names.	Understand	8

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PART – C (PROBLEM SOLVING AND CRITICAL THINKING QUESTIONS)

S. No	Question	Blooms Taxonomy Level	Course Outcome
	UNIT – I **INTRODUCTION TO C LANGUAGE**		

1	**Code 1:**
	         for(i =0, j = 0, i = j; i++, j++)
	                 printf("%d", i);
	Code 2:
	        for(i =0, j = 0, i = = j; i++, j++)
	                printf("%d", i);
	Analyze the above two codes and write the output with valid justification?
		Apply	9

2	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.
		Apply	9

3	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);
	}
	Evaluate the final value of i, j, k from the above code?
		Apply	9

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S. No	Question	Blooms Taxonomy Level	Course Outcome
4	```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;
}
}
}
}``` **Predict** the output of the above code.	Understand	9
5	```switch (N % 6)
{
case 3: printf("Wednesday");
default: printf("Sunday");
case 5:printf("Friday");
}``` In the above code if N = 27, then **predict** the output of the code?	Apply	9
	UNIT – II **FUNCTIONS AND ARRAYS**		
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	```void g(int x[10], int p)
{
x[p] = p;
x[p – p] = p;
}
void main()
{
int arr[3] = {10, 20, 30};
g(arr, 2);
printf("%d%d%d", arr[0], arr[1], arr[2]);
}``` **Predict** the output of the above code.	Apply	9
3	```#define square(x) x*x
void main()
{
int x, y = 3, z = 6;
x = square(y + z) – square(y – z);
printf("x = %d", x);
}``` Analyze the above code and **predict** the output from printf() statement.	Apply	9

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S. No	Question	Blooms Taxonomy Level	Course Outcome

4	char a[5] = "IARE";
	int i =0;
	while(a[i])
	    printf("%s\n", (a + i++));
	Find the output of the above code.
		Apply	9

5	for(putchar('C');putchar('A');putchar('R'))
	putchar('T');
	Predict the output of the above code.
		Apply	9

	UNIT – III **POINTERS AND STRINGS**		

1	**Verify** the following statements which correctly assigns 12 to month using pointer variable pdt?
	  #include<stdio.h>
	  struct date
	  {
	      int day;
	      int month;
	      int year;
	  };
	  int main()
	  {
	      struct date d;
	      struct date *pdt;
	      pdt = &d;
	      return 0;
	  }
		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?
	  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);
	  }
		Apply	9

S. No	Question	Blooms Taxonomy Level	Course Outcome

4	**Analyze** the following program and find the output of the program?
	
	``c
	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));
	}
	``
		Apply	9

5	**Analyze** the following program and find the output of the program?
	
	``c
	void main()
	{
	    char s1[7] = "1234", *p;
	    p = s1 + 2;
	    *p = '\0';
	    printf("%s", s1);
	}
	``
		Apply	9

	UNIT – IV **ENUMERATED, STRUCTURE AND UNION TYPES**		

1	**Analyze** the following program and find out the error in the program?
	
	``c
	#include<stdio.h>
	int main()
	{
	    struct a
	    {
	        float category:5;
	        char scheme:4;
	    };
	    printf("size=%d", sizeof(struct a));
	    return 0;
	}
	``
		Apply	9

2	**Predict** the output of the program?
	
	``c
	#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;
	}
	``
		Apply	9

S. No	Question	Blooms Taxonomy Level	Course Outcome

3	**Predict** the output of the program?
	``c
	#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;
	}
	``
		Apply	9

4	**Analyze** the program and identify the error in the program?
	``c
	#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;
	}
	``
		Apply	9

5	**Analyze** the code and identify the statements which are correct in the following program?
	``c
	#include<stdio.h>
	int main()
	{
	    union a
	    {
	        int i;
	        char ch[2];
	    };
	    union a u1 = {512};
	    union a u2 = {0, 2};
	    return 0;
	}
	``
	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'
		Apply	9

UNIT – V **SEARCHING AND SORTING**		
1	Assume that the operators +, -, × are left associative and ^ is right associative. The order of precedence (from highest to lowest) is ^, *, +, -. **Find** the postfix expression corresponding to the infix expression a + b * c – d ^ e ^ f	Apply	9
2	Suppose a circular queue of capacity (n-1) elements is implemented with an array of n elements. Assume that the insertion and deletion operation are carried out using REAR and FRONT as array index variables, respectively. Initially REAR = FRONT = 0. **Write** the conditions to detect queue full and queue empty?	Apply	9

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S. No	Question	Blooms Taxonomy Level	Course Outcome

3	**Analyze** the function and find the output of following function for start pointing to first node of following linked list?
	1 -> 2 -> 3 -> 4 -> 5 -> 6
	
	``c
	void fun(struct node* start)
	{
	    if(start == NULL)
	    return;
	    printf("%d ", start->data);
	    if(start->next != NULL)
	    fun(start->next->next);
	    printf("%d ", start->data);
	}
	``
		Apply	9

4	The following C function takes a single-linked list of integers as a parameter and rearranges the elements of the list. The function is called with the list containing the integers 1, 2, 3, 4, 5, 6, 7 in the given order. **Analyze** the code and find the contents of the list after the function completes execution?
	
	``c
	struct node
	{
	    int value;
	    struct node *next;
	};
	void rearrange(struct node *list)
	{
	    struct node *p, *q;
	    int temp;
	    if((!list) || !list -> next)
	        return;
	    p = list;
	    q = list ->next;
	    while(q)
	    {
	        temp = p -> value;
	        p -> value = q -> value;
	        q -> value = temp;
	         p = q-> next;
	         q = p ? p -> next : 0;
	    }
	}
	``
		Apply	9

5	You are given pointers to first and last nodes of a singly linked list, **Identify** the following operations which are dependent on the length of the linked list? a. Delete the first element b. Insert a new element as a first element c. Delete the last element of the list d. Add a new element at the end of the list	Apply	9