

Time: 3 Hours

Total Marks: 80

N.B

- (1) Question no. 1 is compulsory.
- (2) Attempt any 3 from the remaining questions.
- (3) Assume suitable data if necessary.
- (4) Figures to right indicate full marks.

Q.1 a Attempt the Multiple Choice Questions

6

```
i) #include <stdio.h>
int main()
{
    int a=0;
    a=a++ + a++ - a++ + ++a;
    printf("%d\n", a);
    return 0;
}
```

The output of above program is

- (a) 2 (b) 0 (c) 3 (d) Error

ii) Which of the following operator can be used to access value at address stored in a pointer variable?

- (a) * (b) @ (c) & (d) &&

iii) In C Programming which of the operator have the highest precedence

- (a) Relational (b) Arithmetic (c) Bitwise (d) Logical

iv) Which of the following are themselves a collection of different data types?

- (a) string (b) 2D Arrays (c) structures (d) char

v) If x and b are the float variable what is the value of x when x=sizeof(b).

- (a) 2 (b) 3 (c) 4 (d) Null

vi) The default value of static storage class variable is

- (a) Zero (b) Garbage (c) One (d) None of above

b) Find the output of following

4

```
i) ) #include <stdio.h>
int main()
{
    int a=1;
    do{
        a++;
        ++a;
    }while(a++>25);
    printf("%d\n",a);
    return 0;
}
```

```

ii) #include <stdio.h>
int main()
{
    int x;
    x = 10;
    if(x > 10)
        x -= 10;
    else if(x >= 0)
        x += 00;
    else if(x)
        x += 10;
    else
        x -= 10;

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

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|----|--|---|
| c) | Convert the following | 6 |
| | i) 153 from base 10 to Hexadecimal | |
| | ii) 1100 1101 1001 1011 from base 2 to decimal | |
| | iii) 143 from base 8 to decimal | |

- | | | |
|----|---|---|
| d) | Differentiate between Structure and Union | 4 |
|----|---|---|

- | | | |
|-----|---|---|
| Q.2 | a) What is recursion? Write a program using recursion to calculate the value of $Z=X^Y$. | 8 |
| | b) Write a function to reverse a 3 digit number | 6 |
| | c) Write a program to display following pattern | 6 |

```

        0
       0 1
      0 1 0
     0 1 0 1
    0 1 0 1 0
    
```

- | | | |
|-----|--|----|
| Q.3 | a) Write a program to find the frequency of digits in a set of numbers and remove duplicates from an array .For ex. array $A=\{1,2,3,4,2,5,2\}$ frequency of 2 is 3 and resultant array is $A=\{1,2,3,4,5\}$. | 10 |
| | b) Explain the concept of nested structure? Declare a structure to enter employee Information like name, id, salary, date of joining. Use nested structure to get the address of an employee. Write a program to read 10 records and display them. | 10 |

- | | | |
|-----|---|----|
| Q.4 | a) Explain strncat() & strcpy() with example. Also write a program to check whether entered string is palindrome or not without using inbuilt string functions. | 10 |
| | b) Differentiate between call by value and call by reference. Write a program to calculate Factorial of a number using call by reference. | 10 |

- Q.5 a) What is file? Explain the functions available for Reading & Writing data of files? 10
Write a program to take student information from user and store it in file.
- b) Write a program to calculate sum of diagonal elements of a matrix. 10
For ex.
1 2 3
5 9 8
1 4 7
Calculate the sum of diagonal elements=3+9+1=13
- Q.6 a) Explain storage classes with example. 10
- b) Write a program to find greatest number among three entered number using ternary operator 4
- c) Write a program to calculate the sum of series $x - x/2! + x/3! - x/4! + \dots + x/n!$ 6