Name- Sumit Kumar Giri
Course- B.Tech (CSE)
Uni. roll no.- 2000213 (CS2)
Subject- OOPS (machine exercise- 2nd)
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Q1. Solve the following expression using operator Precedence:

(i) 100+200/10-3*10

⇒ Code:-

```
#include<iostream.h>
#include<conio.h>
  int main();
  {
     double ans;
     clrscr();
     ans = 100+200/10-3*10;
     Cout<<"answer is"<<ans<<endl;
     // ans is 90
     getch();
     return 0;
  }
```

Q1

(i)

OUTPUT

100+200/10-3*10

ans is 90.

(ii) 1==2!=3

⇒ Code:-

```
#include<iostream.h>
#include<conio.h>
    int main()
    {
     int ans;
     clrscr();
     cout<<ans;
     // ans is 1
      getch();
      return 0;
    }
```

1. (ii)

OUTPUT

ans = 1 = = 2 ! = 3

ans is 1

Q2. Calculate roots of quadratic equation.

⇒

Code:-

```
# include < iostream.h>
# include < conio.h>
# include < math.h>
 int main()
{
    float a,b,c,x1,x2,discriminant, realpart, imaginarypart;
     clrscr();
     cout << "enter coefficient a,b,c: ";
     cin >> a >> b >> c;
   discriminant = b*b-4*a*c;
   if (discriminant>0)
   {
      x1 = (-b+sqrt(discriminant))/(2*a);
      x2 = (-b-sqrt(discriminant))/(2*a);
   cout << "roots are real and different." << endl;
   cout << "x1 = " << x1 << endl;
   cout << "x2 = " << x2 << endl;
}
 else if (discriminant ==0)
 {
  cout << "roots are real and same." << endl;
  x1 = -b/(2*a);
  cout << "x1 = x2 = " << x1 << endl;
}
 else
   {
     realpart = -b/(2*a)
```

```
imaginarypart = sqrt(-discriminant)/(2*a);

cout << " roots are complex and different" << endl;
cout << " x1 = " << realpart << " " << imaginarypart
                                << "i" << endl;
cout << "x2 = " << realpart << " " << imaginarypart
                                << "i" << endl;
}
   getch();
   return 0;
}
```

OUTPUT

(i) Enter Coefficient a, b, C : 9
−15
6

roots are real and different

$X_1 = 1$

$X_2 = 0.6667$

(ii) Enter Coefficient a, b, C: 12
4
1

roots are Complex and different.

$X_1 = -0.166667 , 0.235702i$

$X_2 = -0.166667, 0.235702i$

Q3. Calculate the sum of n natural number.

⇒ Code :-

```
# include< iostream.h>
# include < conio.h>
   void main ()
   {
      int sum, N;
       Clrscr();
      Cout << "enter the limit: ";
       Cin >> N;
       Sum = N * (N+1)/2;
      Cout << " The sum of first: " << N <<
                        "Natural number is " << Sum;

   }getch();
```

Q3.

OUTput

Enter the limit : 20
the Sum of first : 20 Natural number is 210

Q4. Check whether a number entered is prime number or not.

⇒

Code :-

```
# include < iostream.h>
# include < conio.h>
  int main()
 {
   int n,i, m=0, flag=0;
   clrscr();
   cout << " enter the no. to check prime : ";
   cin >> n;
   m= n/2 ;
   for (i=2; i<=m ; i++)
  {
   if (n%  i==0)
  {
   cout << " no. is not prime:" << endl;
    flag = 1;
    break ;
  }
 }
 If (flag ==0)
  cout << "no. is prime" << endl;
 getch();
}
```

Q4.

OUTPUT:-

Enter the no. to check prime: 17

no. is prime.

Enter the no. to check prime: 16

no. is not prime.

Q5. Check whether a character is vowel or Consonant.

⇒

Code:-

```
# include <iostream.h>
# include <conio.h>
  int main();
  {
    char c;
    clrscr();
    cout << " enter a character \n";
    cin >> c;
   If ( c=='a' || c=='i' || c=='o' || c=='u' || c=='a'
          || c=='e')

   cout << c << " is vowel";
    else
     {
       Cout << c << " is Consonant";
   }
     getch();
      return 0;
   }
```

Q5.

OUTPUT:-

```
enter a character
= r
r is consonant.

enter a character
= e
e is vowel.
```

Q6. check whether a number entered is palindrome or not.

⇒

Code:-

```
#include<iostream.h>
#include<conio.h>
void main()
{
  clrscr();
  int n, r=0, temp;
  cout<<"Enter any number";
  cin>>n
  temp=n;

  while (n=0)
   {
     r= r+(n%10);
     n= n/10;
  {
   if(r==temp)

    cout<<n" is a palindrome;
  }
  getch();
}
```

OUTPUT:-

Enter a number: 1234321

1234321 is Palindrome Number.

ENTER a number: 123456

123456 is not a palindrome Number.

Q7. Check whether a number entered is armstrong or not.

⇒ Code :-

```
# include< iostream.h>
# include< conio.h
  int main()
  {
  int number, sum=0, lastdigit temp;
   clrscr();
  cout << " enter a number\n";
   cin >> number ;
   temp= number ;
   while (temp !=0)
    {
     lastdigit = temp% 10;
    Sum= sum +(lastdigit * lastdigit * lastdigit);
     temp= temp/10 ;
   }
   IF (Sum = =number)
  {
      cout << number<< " is armostrong number";
  }
    else
     { cout <<phpi
    cout<< number << " is not an armstrong.";
    }
     getch();
     return 0;
  }
```

Q7

OUTPUT:-

Enter a number: 153

153 is not Armstrong number.

Enter a number: 1234321

1234321 is a armstrong number.

Q8. Make a Simple Calculator to Add, Subtract, Multiply or Divide using Switch Case.

⇒ Code :-

```
#include<iostream.h>
#include<conio.h>
int main()
 {
   Char oper;
   clrscr();
   float num1,num2;
   Cout<<"Enter an operator (+,-,*,/): ";
   Cin>> oper;
   Cout<<" enter two no. : "<<endl;
   Cin>> num1>>num2;
   Switch (oper)
   {
    Case '+';
    Cout <<num1<<"+"<<num2<<"="<<num1+num2;
    break;
   Case'-';
  Cout<<num1<<"-"<<num2<<"="<<num1-num2;
   break;
   Case'*';
  Cout <<num1<<"*"<<num2<<"*"<<num1*num2;
   break;
  Case'/';
  Cout<<num1<<"/"<<num2<<"="num1/num2;
     break;
  } getch();
     return 0;
     }
```

Q8.

OUTPUT:-

(i) enter an operation (+,-,*,/): +

enter two no.: 12
=14

= 12+14=26

(ii) enter an operation (+,-,*,/): -

enter two no.: 54
= 34

= 54-34=20

Q9. use switch case:

Case 1: Convert binary into decimal without using inbuitt function.
Case 2: Convert decimal into binary without using inbuilt function.

Case 1: Binary into decimal.

```
# include< iostream.h>
# include< conio.h>
# include< math.h>
  int main()
  {
   long long num;
   clrscr();
   int decimalnum, i, rem;
   Cout << " enter any binary number: ";
   Cin>> num;
   decimalnum = 0;
   i = 0;
   while (num != 0)
   {
    rem = num % 10;
     num /= 10;
    decimalnum += rem * Pow(2,i);
    ++i;
   }
   Cout << " equivalent decimal number: "<< decimalnum
                                        << endl;
   getch();
   return 0;
  }
```

Q9. (a)

OUTPUT

enter any binary number: 10101

equivalent decimal number: 21

(b) Case-2: Decimal into Binary.

=> Code:-

```
# include<iostream.h>
# include<conio.h>
# include<math.h>
 int main()
 {
  int num, binarynum=0;
   clrscr();
   int i=1, rem;
  cout<<"enter any decimal number";
  cin>>Num;
 while (num!=0)
  {
    rem=num%2;
    num/=2;
    binarynum+=rem*i;
     i*=10;
  }
  cout<<"Equivalent Binary number: "<<binarynum<<endl;

  getch();
   return 0;
}
```

Q9. (b)

Case-2

OUTPUT

enter any decimal number: 20

Equivalent Binary number: 10100

Q10. Print the following pattern :

(a)

A

B B

C C C

D D D D

⇒ Code:-

```
#include<iostream.h>
#include<conio.h>
void main()
{
 clrscr();
 int i,j,n;
cout<<" Enter number of rows: ";
cin>>n;
char ch='A';
for(i=1;i<=n;i++)
 {
 for(j=1;j<=i;j++)
cout<<ch<<"  ";
 ch++;
cout<<endl;
 }
 getch();
}
```

10.

(a)

OUTPUT

```
Enter number of rows: 4
A
B B
C C C
D D D D
```

(b)

```
        *
      * * *
    * * * * *
```

⇒ Code :-

```
#include <iostream.h>
#include <conio.h>
void main()
{
   clrscr();
  int i,j,n,s;
  cout << "Enter number of rows: ";
  cin >> n;
  for (i=1; i<=n; i++)
  {
  for (s=i; s<n; s++)
  {
  cout << " ";
  }
  for (j=1; j<=(2*i-1); j++)
  {
   cout << "*";
  }
  cout << "\n";
  }
  getch();
}
```

b)

OUTPUT

Enter number of rows: 3

```
  *
 * * *
* * * * *
```

(C)

```
* * * * * * * * *
  * * * * * * *
    * * * * *
      * * *
        *
```

⇒ Code:→

```
# include<iostream.h>
# include<conio.h>
  void main()
  {
    clrscr();
    int n,i,j,k;
    cout<<"Enter no. of rows you want to print";
    cin>>n;
    For (i=0; i<=n; i++)
   {
    For (k=0; k<=i; k++)
   {
    Cout<<" * ";
   }
    Cout<<"\n";
    }
    getch();
  }
```

(C)

OUTPUT

Enter number of rows you want to print: 5