Practical No.03 (Operators , if conditions)

Q1.

```c
#include <stdio.h>

#include <stdlib.h>


int main()

{

    int no1,no2;


    printf("Enter the 1st Number \n");

    scanf("%d",&no1);

    printf("Enter the 2nd  number \n");

    scanf("%d",&no2);


    if

        (no1<no2)

        printf("Highest Number is - %d ",no2);

    else

        printf("Highest Number is - %d ",no1);


    return 0;

}
```

Q2.

```c
#include <stdio.h>
int main() {
 int num1, num2, num3, largest, smallest;
printf("Enter three numbers: ");
 printf("\n");
 scanf("%d %d %d", &num1, &num2,&num3);


 largest = num1;
 smallest = num1;


 if (num2 > largest) {
  largest = num2;
 }
 if (num3 > largest) {
  largest = num3;
 }
 if (num2 < smallest) {
  smallest = num2;
 }
 if (num3 < smallest) {
```

```c
        smallest = num3;
    }
    printf("The largest number is %d\n", largest);
    printf("The smallest number is %d\n", smallest);
    return 0;
}
```

Q3.

```c
#include <stdio.h>
#include <stdlib.h>

int main()
{
char empname[20];
float bs,inc,ns;

printf("Enter employee name : ");
scanf("%s",&empname);

printf("Enter basic salary : ");
scanf("%f",&bs);
```

```c
if(bs>=10000)
 inc=bs*0.15;

else if(bs>=5000)
 inc=bs*0.10;

else
 inc=bs*0.05;

 ns=bs+inc;

 printf("Employee name : %s\n",empname);
 printf("New salary : %.2f\n",ns);

}
```

Q4.

```c
#include <stdio.h>
#include <stdlib.h>
int main()
{
```

```c
    float radi;

    printf("Enter the Radius of the circle :- ");

    scanf("%f",&radi);


    printf("Diameter is %.2f \n",radi*2.0);

    printf("Circumference is %.2f \n",radi*2.0*3.14159);

    printf("Area is %.2f \n",radi*radi*3.14159);


    return 0;
}
```

Q5.

```c
#include <stdio.h>
#include <stdlib.h>

int main()
{
  int no1,no2;

  printf("Enter the First Number :- ");
  scanf("%d",&no1);
```

```c
    printf("Enter Second Number :- ");

    scanf("%d",&no2);


    if(no1%no2==0)

    printf("First is a multiple of second Number");


    else

    printf("Second is a not multiple number");

    return 0;

}
```

Q6.

```c
#include <stdio.h>

#include <ctype.h>

int main() {


  printf("The integer equivalent of A is: %d\n", 'A');

  printf("The integer equivalent of B is: %d\n", 'B');

  printf("The integer equivalent of C is: %d\n", 'C');


  printf("The integer equivalent of a is: %d\n", 'a');
```

```c
    printf("The integer equivalent of b is: %d\n", 'b');

    printf("The integer equivalent of c is: %d\n", 'c');


    printf("The integer equivalent of 0 is: %d\n", '0');

    printf("The integer equivalent of 1 is: %d\n", '1');

    printf("The integer equivalent of 2 is: %d\n", '2');


    printf("The integer equivalent of $ is: %d\n", '$');

    printf("The integer equivalent of * is: %d\n", '*');

    printf("The integer equivalent of + is: %d\n", '+');

    printf("The integer equivalent of / is: %d\n", '/');


    printf("The integer equivalent of the blank character is: %d\n", '\0');


    return 0;
}
```

Q7.


```c
#include <stdio.h>

int main() {
```

```c
float basicSalary;

int yearsOfService;

char city;

float additionalAllowance = 0,bonus = 0,grossRemuneration;


printf("Enter The Basic Salary : ");

scanf("%f", &basicSalary);


printf("Enter Your Year Of Experience : ");

scanf("%d", &yearsOfService);


printf("Enter Your Working City : ");

scanf(" %c", &city);


if (yearsOfService > 5)

    additionalAllowance += 0.10 * basicSalary;

if (city == 'C')


    additionalAllowance += 2500;

if (basicSalary >= 50000)


    bonus += 0.15 * basicSalary;
```

```c
    else if (basicSalary >= 25000)
      bonus += 0.12 * basicSalary;
    else
      bonus += 0.10 * basicSalary;


  grossRemuneration = basicSalary + additionalAllowance + bonus;


printf("Gross Monthly Remuneration: %.2f\n", grossRemuneration);
}
```

Practical 04 (Selection Control Structures)

Q1.

```c
#include <stdio.h>

int main() {
  int number;

  printf("Enter an integer: ");
  scanf("%d", &number);
```

```c
    if (number % 2 == 0) {
        printf("%d is even.\n", number);
    } else {
        printf("%d is odd.\n", number);
    }

    return 0;
}
```

```c
#include <stdio.h>

int main() {
    int number;

    printf("Enter an integer: ");
    scanf("%d", &number);

    switch (number % 2) {
        case 0:
            printf("%d is even.\n", number);
```

```c
            break;
        case 1:
            printf("%d is odd.\n", number);
            break;
    }


    return 0;
}
```

Q2.

```c
#include <stdio.h>
#include <stdlib.h>

int main()
{
    int num1,num2,opr;

    printf("01.Addition \n");
    printf("02.Multification \n");
    printf("03.Subtraction \n");
    printf("04.Devision \n");
```

```c
    printf("\n\n\n");
    printf("Choose The Number ->");
    scanf("%d",&opr);

    printf("Enter The Number :-");
    scanf("%d %d",&num1,&num2);

    switch(opr)
{
    case 01 :
        printf("%d",num1+num2);
        break;

    case 02 :
        printf("%d",num1*num2);
        break;

    case 03 :
        printf("%d",num1-num2);
        break;

    case 04 :
```

```c
        printf("%.2f",(float)num1/num2);

        break;


    default:

        printf("Invalid");

}

    return 0;

}
```

Q3.

```c
#include <stdio.h>
#define PI 3.14159

int main() {
    int choice;
    float radius, result;

    printf("Menu:\n");
    printf("1. Calculate Circumference of a Circle\n");
    printf("2. Calculate Area of a Circle\n");
    printf("3. Calculate Volume of a Sphere\n");
```

```c
printf("Enter your choice (1-3): ");
scanf("%d", &choice);

printf("Enter the radius : ");
scanf("%f", &radius);

switch (choice) {
    case 1:
        result = 2 * PI * radius;
        printf("Circumference: %.2f\n", result);
        break;
    case 2:
        result = PI * radius * radius;
        printf("Area: %.2f\n", result);
        break;
    case 3:
        result = (4.0 / 3.0) * PI * radius * radius * radius;
        printf("Volume: %.2f\n", result);
        break;
    default:
        printf("Invalid choice.\n");
}
```

```c
    return 0;
}
```

Q4.

```c
#include <stdio.h>
int main() {
    char vowal;

    printf("Enter a character : ");
    scanf("%c", &vowal);

    switch (vowal)
    {
        case 'a':
            printf("vowel\n");break;
        case 'e':
            printf("vowel\n");break;
        case 'i':
            printf("vowel\n");break;
        case 'o':
```

```c
        printf("vowel\n");break;
    case 'u':
        printf("vowel\n");break;
    case 'A':
        printf("vowel\n");break;
    case 'E':
        printf("vowel\n");break;
    case 'I':
        printf("vowel\n");break;
    case 'O':
        printf("vowel\n");break;
    case 'U':
        printf("vowel\n");break;
    default:
        printf("not a vowel!\n");break;

}
}
```

Q5.

```c
#include <stdio.h>

int main() {
    int month;

    printf("Enter the month number (1-12): ");
    scanf("%d", &month);

    switch (month) {
        case 1:
            printf("January has 31 days.\n");break;
        case 2:
            printf("February has 28 days.\n");break;
        case 3:
            printf("March has 31 days.\n");break;
        case 4:
            printf("April has 30 days.\n");break;
        case 5:
            printf("May has 31 days.\n");break;
        case 6:
            printf("June has 30 days.\n");break;
```

```c
        case 7:
            printf("July has 31 days.\n");break;
        case 8:
            printf("August has 31 days.\n");break;
        case 9:
            printf("September has 30 days.\n");break;
        case 10:
            printf("October has 31 days.\n");break;
        case 11:
            printf("November has 30 days.\n");break;
        case 12:
            printf("December has 31 days.\n");break;
        default:
            printf("Invalid month number.\n");break;
    }

    return 0;
}
```

Practical 05 (Iteration control structure)

Q1.

While loop

```
#include <stdio.h>
#include <stdlib.h>

int main() {
  int i = 0;
  while (i <= 100) {
    printf("%d\n", i);
    i++;
  }
  return 0;
}
```

* Do-while loop

```
#include <stdio.h>
#include <stdlib.h>
```

```c
int main() {
  int i = 0;
  do {
    printf("%d\n", i);
    i++;
  } while (i <= 100);
  return 0;
}
```

* For loop

```c
#include <stdio.h>
#include <stdlib.h>

int main() {
  for (int i = 0; i <= 100; i++) {
    printf("%d\n", i);
  }
  return 0;
}
```

Q2.

```c
#include <stdio.h>

int main() {
  int marks[10], i, total = 0;
  float average;

  for (i = 0; i < 10; i++) {
    printf("Enter mark %d: ", i + 1);
    scanf("%d", &marks[i]);
  }

  for (i = 0; i < 10; i++) {
    total += marks[i];
  }

  average = total / 10.0;

  if (average < 50) {
    printf("Fail!\n");
  } else {
    printf("Pass!\n");
```

```c
  }


  return 0;

}
```

Q3.

```c
#include <stdio.h>
int main() {
  int number, factorial = 1;


  printf("Enter a number: ");
  scanf("%d", &number);


  if (number < 0) {
    printf("Factorial is not defined for negative numbers.\n");
  }
  for (int i = 1; i <= number; i++) {
    factorial = factorial * i;
  }
  printf("The factorial of %d is: %d\n", number, factorial);
  return 0;
}
```

Q4.

```c
#include <stdio.h>

int main() {
  int number, digit, sum = 0;

  printf("Enter a number : ");
  scanf("%d", &number);

  while (number > 0) {
    digit = number % 10;
    sum += digit;
    number = number / 10;
  }

  printf("Sum of the digits is : %d\n", sum);

  return 0;
}
```

Q5.

```c
#include <stdio.h>

int main() {
  int num, rn = 0, digit;

  printf("Enter a number : ");
  scanf("%d", &num);

  do {
    digit = num % 10;
    rn = rn * 10 + digit;
    num = num / 10;
  } while (num > 0);

  printf("The reversed number is : %d\n", rn);

  return 0;
}
```

Q6.

```c
#include <stdio.h>

int main() {
    int base, exp, res = 1;

    printf("Enter the base: ");
    scanf("%d", &base);

    printf("Enter the exponent: ");
    scanf("%d", &exp);

    int i;
    for (i = 0; i < exp; i++) {
        res *= base;
    }

    printf("%d raised to the power %d is: %d\n", base, exp, res);

    return 0;
}
```

Q7.

```c
#include <stdio.h>

int main() {
    int num = 10;
    int fib[num];
    int i;

    fib[0] = 0;
    fib[1] = 1;

    for (i = 2; i < num; i++) {
        fib[i] = fib[i-1] + fib[i-2];
    }
    printf("The first 10 numbers of the Fibonacci sequence are:\n");
    for (i = 0; i < num; i++) {
        printf("%d ", fib[i]);
    }
    printf("\n");

    return 0;
}
```

Q8.

```c
#include <stdio.h>
int main() {
  int num, tem, dg, sum = 0;

  printf("Enter a number : ");
  scanf("%d", &num);

  tem = num;
  while (tem > 0) {
    dg = tem % 10;
    sum += dg * dg * dg;
    tem /= 10;
  }
  if (num == sum) {
    printf("%d is an Armstrong number.\n", num);
  } else {
    printf("%d is not an Armstrong number.\n", num);
  }

  return 0;
}
```

Q9.

```c
#include <stdio.h>

int main() {
    char let;

    printf("All ASCII values for letters A to Z:\n");

    for (let = 'A'; let <= 'Z'; ++let) {
        printf("%c: %d\n", let, let);
    }

    return 0;
}
```

Q10.

```c
#include <stdio.h>

int main() {
    int rows = 5;
    int a, b;

    for (a = 1; a <= rows; ++a) {
        for (b = 1; b <= a; ++b) {
            printf("*");
        }
        printf("\n");
    }
    return 0;
}
```

Q11.

```c
#include <stdio.h>
int main() {
    int num, a, isp = 1;
    printf("Enter a positive integer: ");
    scanf("%d", &num);
    if (num == 0 || num == 1) {
        isp = 0;
    } else {
        for (a = 2; a <= num / 2; ++a) {
            if (num % a == 0) {
                isp = 0;
                break;
            }}}
    if (isp) {
        printf("%d is a prime number.\n", num);
    } else {
        printf("%d is not a prime number.\n", num);
    }

    return 0;
}
```

Q12.

```c
#include <stdio.h>

int main() {
    int num, i;

    printf("Enter a positive integers : ");
    scanf("%d", &num);

    printf("Factors of %d are : ", num);

    for (i = 1; i <= num; ++i) {
        if (num % i == 0) {
            printf("%d ", i);
        }
    }

    printf("\n");

    return 0;
}
```

Q13.

```c
#include <stdio.h>

int main() {
    int num;
    int sum = 0;

    printf("Enter numbers to be added (enter -1 to stop):\n");

    while (1) {
        scanf("%d", &num);

        if (num == -1) {
            break;
        }

        sum += num;
    }

    printf("The sum is: %d\n", sum);
    return 0;
}
```

Q14.

```c
#include <stdio.h>

int main() {
    int ar[10];
    int in;

    printf("Enter 10 integers:\n");

    for (in = 0; in < 10; in++) {
        scanf("%d", &ar[in]);
    }

    printf("The entered array is: ");
    for (in = 0; in < 10; in++) {
        printf("%d ", ar[in]);
    }
    printf("\n");

    return 0;
}
```

Q15.

```c
#include <stdio.h>

int main() {
    int ar[10];
    int in, co = 0;

    printf("Enter 10 integers:\n");

    for (in = 0; in < 10; in++) {
        scanf("%d", &ar[in]);
    }

    for (in = 0; in < 10; in++) {
        if (ar[in] % 2 == 0) {
            co++;
        }
    }
    printf("The count of even numbers in the array is: %d\n", co);

    return 0;
}
```

1.

```c
#include <stdio.h>

int main() {
    int num[10];
    int i, pc = 0, nc = 0, zc = 0;

    printf("Enter 10 Numbers:\n");

    for (i = 0; i < 10; i++) {
        scanf("%d", &num[i]);
    }

    for (i = 0; i < 10; i++) {
        if (num[i] > 0) {
            pc++;
        } else if (num[i] < 0) {
            nc++;
        } else {
            zc++;
```

```c
        }
    }

    printf("Positive Numbers: %d\n", pc);
    printf("Negative Numbers: %d\n", nc);
    printf("Zeros: %d\n", zc);

    return 0;
}
```

2.

```c
#include <stdio.h>
int main() {
    int marks[10];
    int in, tm = 0, maxm, minm;

    printf("Enter marks of 10 students:\n");

    for (in = 0; in < 10; in++) {
        scanf("%d", &marks[in]);
        tm += marks[in];
```

```c
    if (in == 0) {

        maxm = marks[in];

        minm = marks[in];

    } else {

        if (marks[in] > maxm) {

            maxm = marks[in];

        }

        if (marks[in] < minm) {

            minm = marks[in];

        }

    }

}


double am = (double) tm / 10;


printf("Maximum Marks: %d\n", maxm);

printf("Minimum Marks: %d\n", minm);

printf("Average Marks: %.2lf\n", am);


return 0;

}
```

3.

```c
#include <stdio.h>
int main() {
    double pr[10];
    int in, count = 0;
    double tot = 0.0;

    printf("Enter prices of 10 items:\n");

    for (in = 0; in < 10; in++) {
        scanf("%lf", &pr[in]);
        tot += pr[in];

        if (pr[in] > 200) {
            count++;
    }}
    double av = tot / 10;
    printf("Average value of an item: %.2lf\n", av);
    printf("Number of items with price > 200: %d\n", count);

    return 0;
}
```

4.

```c
#include <stdio.h>
int main() {
    int empno, count = 0;
    double bs;
    printf("Enter employee number and basic salary : \n");

    while (1) {
        scanf("%d", &empno);
        if (empno == -999) {
            break;
        }
        scanf("%lf", &bs);
        if (bs >= 5000) {
            count++;
        }
    }
    printf("Number of employees with a basic salary >= 5000: %d\n", count);

    return 0;
}
```

5.

```c
#include <stdio.h>

int main() {
    int empno, count = 0, oc = 0;
    double hw, op, totop = 0.0;

    printf("Enter employee number and hours worked :\n");

    scanf("%d", &empno);

    while (empno != -999) {
        scanf("%lf", &hw);

        if (hw > 40) {
            op = 150 * 40 + 200 * (hw - 40);
        } else {
            op = 150 * hw;
        }
        printf("Employee number: %d\n", empno);
        printf("Overtime payment: %.2lf\n", op);
```

```c
        totop += op;

        count++;

        if (op > 4000) {

            oc++;

        }

        scanf("%d", &empno);

    }

    double pex4000 = (double) oc / count * 100;


    printf("\nSummary:\n");

    printf("Total employees: %d\n", count);

    printf("Total overtime payment: %.2lf\n", totop);

    printf("Percentage of employees with overtime payment exceeding Rs. 4000: %.2lf%%\n", pex4000);


}
```