CHAPTER SEVEN

Case Control Instruction

] What will be the output of the following programs:

```
# include <stdio.h>
int main( )
{
    char  suite = 3 ;
    switch ( suite )
    {
        case 1 :
            printf ( "Diamond\n" ) ;
        case 2 :
            printf ( "Spade\n" ) ;
        default :
            printf ( "Heart\n" ) ;
    }
    printf ( "I thought one wears a suite\n" ) ;
    return 0 ;
}
```

Output:

```
Heart
I thought one wears a suite
```

(b)
```
# include <stdio.h>
int main( )
{
    int c = 3 ;
    switch ( c )
    {
        case '3' :
            printf ( "You never win the silver prize\n" ) ;
            break ;
        case 3 :
            printf ( "You always lose the gold prize\n" ) ;
            break ;
        default :
            printf ( "Of course provided you win a prize\n" ) ;
    }
    return 0 ;
}
```

Output:

You always lose the gold prize

(c)
```
# include <stdio.h>
int main( )
{
    int i = 3 ;
    switch ( i )
    {
        case 0 :
            printf ( "Customers are dicey\n" ) ;
        case 1 + 0 :
            printf ( "Markets are pricey\n" ) ;
        case 4 / 2 :
            printf ( "Investors are moody\n" ) ;
        case 8 % 5 :
            printf ( "At least employees are good\n" ) ;
    }
    return 0 ;
```

```
}
```

Output:

```
At least employees are good
```

(d)
```
# include <stdio.h>
int main( )
{
    int  k ;
    float j = 2.0 ;
    switch ( k = j + 1 )
    {
        case 3 :
            printf ( "Trapped\n" ) ;
            break ;
        default :
            printf ( "Caught!\n" ) ;
    }
    return 0 ;
}
```

Output:

```
Trapped
```

(e)
```
# include <stdio.h>
int main( )
{
    int  ch = 'a' + 'b' ;
    switch ( ch )
    {
        case 'a' :
        case 'b' :
            printf ( "You entered b\n" ) ;
        case 'A' :
            printf ( "a as in ashar\n" ) ;
        case 'b' + 'a' :
            printf ( "You entered a and b\n" ) ;
```

```
    }
    return 0 ;
}
```

Output:

```
You entered a and b
```

(f)
```
# include <stdio.h>
int main( )
{
    int i = 1 ;
    switch ( i - 2 )
    {
        case -1 :
            printf ( "Feeding fish\n" ) ;
        case 0 :
            printf ( "Weeding grass\n" ) ;
        case 1 :
            printf ( "Mending roof\n" ) ;
        default :
            printf ( "Just to survive\n" ) ;
    }
    return 0 ;
}
```

Output:

```
Feeding fish
Weeding grass
mending roof
Just to survive
```

[B] Point out the errors, if any, in the following programs:

(a)
```
# include <stdio.h>
int main( )
{
    int suite = 1 ;
```

```
    switch ( suite ) ;
    {
        case 0 ;
            printf ( "Club\n" ) ;
        case 1 ;
            printf ( "Diamond\n" ) ;
    }
    return 0 ;
}
```

Error. Semi-colon after *switch* statement and after *case 0* and *case 1*.

(b)
```
# include <stdio.h>
int main( )
{
    int  temp ;
    scanf ( "%d", &temp ) ;
    switch ( temp )
    {
        case ( temp <= 20 ) :
            printf ( "Ooooooohhhh! Damn cool! \n" ) ;
        case ( temp > 20 && temp <= 30 ) :
            printf ( "Rain rain here again! \n" ) ;
        case ( temp > 30 && temp <= 40 ) :
            printf ( "Wish I am on Everest\n" ) ;
        default :
            printf ( "Good old nagpur weather\n" ) ;
    }
    return 0 ;
}
```

Error. Relational operators cannot be used in cases.

(c)
```
# include <stdio.h>
int main( )
{
    float  a = 3.5 ;
```

```
    switch ( a )
    {
        case 0.5 :
            printf ( "The art of C\ " ) ;
            break ;
        case 1.5 :
            printf ( "The spirit of C\n" ) ;
            break ;
        case 2.5 :
            printf ( "See through C\n" ) ;
            break ;
        case 3.5 :
            printf ( "Simply c\n" ) ;
    }
    return 0 ;
}
```

Error. Floats cannot be used in cases.

(d)
```
# include <stdio.h>
int main( )
{
    int a = 3, b = 4, c ;
    c = b – a ;
    switch ( c )
    {
        case 1 || 2 :
            printf ( "God give me an opportunity to change things\n" ) ;
            break ;

        case a || b :
            printf ( "God give me an opportunity to run my show\n" ) ;
            break ;
    }
    return 0 ;
}
```

Error. A case needs a constant expression. Logical operators cannot be used in cases.

[C] Write a menu driven program which has following options:

1. Factorial of a number
2. Prime or not
3. Odd or even
4. Exit

Once a menu item is selected the appropriate action should be taken and once this action is finished, the menu should reappear. Unless the user selects the 'Exit' option the program should continue to work.

Hint: Make use of an infinite **while** and a **switch** statement.

Program:

```
/* Menu driven program */
# include <stdio.h>

int main( )
{
    int choice, num, i ;
    unsigned long int fact ;

    while ( 1 )
    {
        printf ( "\n\n1. Factorial\n" ) ;
        printf ( "2. Prime\n" ) ;
        printf ( "3. Odd / Even\n" ) ;
        printf ( "4. Exit\n" ) ;

        printf ( "\nYour choice ? " ) ;
        scanf ( "%d", &choice ) ;

        switch ( choice )
```

```
{
    case 1 :
        printf ( "\nEnter number: " ) ;
        scanf ( "%d", &num ) ;

        fact = 1 ;
        for ( i = 1 ; i <= num ; i++ )
            fact = fact * i ;
        printf ( "Factorial value = %lu\n", fact ) ;
        break ;

    case 2 :
        printf ( "\nEnter number: " ) ;
        scanf ( "%d", &num ) ;

        for ( i = 2 ; i < num ; i++ )
        {
            if ( num % i == 0 )
            {
                printf ( "Not a prime number\n" ) ;
                break ;
            }
        }
        if ( i == num )
            printf ( "\nPrime number" ) ;
        break ;

    case 3 :
        printf ( "\nEnter number: " ) ;
        scanf ( "%d", &num ) ;

        if ( num % 2 == 0 )
            printf ( "Even number\n" ) ;
        else
            printf ( "Odd number\n" ) ;
        break ;

    case 4 :
```

```
                exit ( 0 ) ; /* Terminates program execution */
            }
        }
        return 0 ;
    }
```

[D] Write a program which to find the grace marks for a student using **switch**. The user should enter the class obtained by the student and the number of subjects he has failed in. Use the following logic:

- If the student gets first class and the number of subjects he failed in is greater than 3, then he does not get any grace. Otherwise the grace is of 5 marks per subject.
- If the student gets second class and the number of subjects he failed in is greater than 2, then he does not get any grace. Otherwise the grace is of 4 marks per subject.
- If the student gets third class and the number of subjects he failed in is greater than 1, then he does not get any grace. Otherwise the grace is of 5 marks.

Program:

```
/* Determine the grace marks obtained by student */
# include <stdio.h>

int main( )
{
    int  c, sub ;

    printf ( "\nEnter the class and number of subjects failed: " ) ;
    scanf ( "%d %d", &c, &sub ) ;

    switch ( c )
    {
        case 1 :
```

```
            if ( sub <= 3 )
                printf ( "Student gets total of %d grace marks\n",
                          5 * sub ) ;
            else
                printf ( "No grace marks\n" ) ;
            break ;

        case 2 :
            if ( sub <= 2 )
                printf ( "Student gets total of %d grace marks\n",
                          4 * sub ) ;
            else
                printf ( "No grace marks\n" ) ;
            break ;

        case 3 :
            if ( sub == 1 )
                printf ( "Student gets 5 grace marks\n" ) ;
            else
                printf ( "No grace marks\n" ) ;
            break ;

        default :
            printf ( "Wrong class entered\n" ) ;
    }

    return 0 ;
}
```