CSE/IT   Batch: Hinglish

Subject: Programming in C
Topic: Switch–Case

[NAT]

1.
```c
#include <stdio.h>
void main( )
{
    int i = 0;
    switch(i)
    {
        case 0: i = i + 1;
        case 1: i = i + 3;
        case 2: i = i * 2;
        break;
        default: i = i + 5;
    }
}
```
The value of i is _____.

[NAT]

2.
```c
#include <stdio.h>
void main( )
{
    int a, b, c, d, e;
    b = 1; c = 1; d = 2; e = –1;
    a = b++ && c-- || d++ && e--;
    switch(c)
    {
        case 0: a = a + 1;
        case 1: a = a – 1;
        default: a = a – 2;
    }
}
```
The final value of (a + b + c + d + e) is _____.

[MCQ]

3.
```c
#include <stdio.h>
int main(void)
{
    int x ;
    scanf("%d", & x);
```

```c
    switch(x)
    {
        case 0: x = x + 1;
        break;
        default: x = x – 1;
        case 1: x = x - 11;
        case 2: x = x + 128;
        break;
    }
    printf("%c", x);
    return 0;
}
```
What is the output when $x = –4$?

(a) p   (b) M
(c) Garbage   (d) ERROR

[MCQ]

4.
```c
#include <stdio.h>
int main(void)
{
    int q, r = 0;
    q = 2 * 3/6 + 2.0/5 + 0.2 * 3;
    r = –q --;
    switch(q - r)
    {
        case 0: printf("Hello");break;
        case 1: printf("Hi");break;
        case 2: printf("best hai");break;
        case 3: printf("GATE Wallah");
        default: printf("2023");
    }
    return 0;
}
```
The output of the program is _____.

(a) Hibest haiGATE Wallah
(b) best haiGATE Wallah
(c) GATE Wallah2023

(d) GATE Wallah

[MCQ]

5.  ```c
    #include<stdio.h>
    int main()
    {
        int j=10, p=0;
        for(;j>0;)
        {
            switch(j)
            {
                case 1: p+=3;
                case 2: p+=5;
                break;
                default: p-=8;
                case 3: p-=7;
                break;
            }
            j=j-3;
            printf("%d\t",p);
        }
        return 0;
    }
    ```
    The output is-
    (a) -15 -30 -42 -45
    (b) -15 -45 -30 -42
    (c) -15 -30 -42 -39
    (d) -15 -30 -45 -37

[NAT]

6.  ```c
    #include<stdio.h>
    int main()
    {
    int x;
    for(x=0; x<32; x++)
    {
        switch(x)
    ```
    ```c
        {
            case 0: x= x+2;
            case 1: x=x+5;
            case 2: x=x+1;
            default: x=x+7;
        }
        printf("%d\t",x);
        }
        return 0;
    }
    ```
    The sum of the values printed is _____.

[MCQ]

7. . Consider the following two statements:
    P: Case label can be integer or character or floating point numbers.
    Q: Only one default is allowed in switch-case structure.
    Which of the following statements are INCORRECT?
    (a) Both P and Q   (b) Only P
    (c) only Q   (d) Neither P or Q.

[MCQ]

8.  ```c
    #include<stdio.h>
    int main()
    {
        int x=4, y=5;
        x=x==y==5;
        switch(1)
        {
            x=x+11;
        }
        printf("%d", ++x);
        return 0;
    }
    ```
    The output is-
    (a) 0   (b) 1
    (c) 11   (d) Compiler Error

Answer Key

1. (8)
2. (2)
3. (a)
4. (c)
5. (d)

6. (69)
7. (b)
8. (b)

Hints and solutions

1. (8)

If no break statements exist then all the case statements are excuted

i = 0;
i = 0 + 1 = 1;
i = 1 + 3 = 4;
i = 4 * 2 = 8

2. (2)

b $\cancel{1}$ 2   c $\cancel{1}$ 0   d $\boxed{2}$ e $\boxed{-1}$

a $\boxed{-1}$

a = b++ && c-- || d++ && e--

This part won't be evaluated because of short circuit

(1 && 1)
↓
True

switch(0)
{
    case 0: a = a + 1 ⇒ a = 1 + 1 = 2
    case 1: a = a − 1 ⇒ a = 2 − 1 = 1
    default: a = a − 2 ⇒ a = 1 − 2 = −1
    ∴ a + b + c + d + e = $-\cancel{1} + \cancel{2} + 0 + 2 − \cancel{1}$ = 2
}

3. (a)

X = -4, default case is executed. Since there are no breaks, case 1 and case 2 will also be executed.

x=x-1;//x=-5
x=x-11;//x=-16
x=x+12;//x=112

The equivalent character with ASCII value 112 is p.

4. (c)

q = 1 + 0.4 + 0.6 = 2.0 when assigned to integer variable, q=2

q $\boxed{\cancel{2}\ 1}$

r $\boxed{\cancel{0}\ -2}$

r = r − q

After this q is decremented to 1.
q − r = 1 + 2 = 3
Output: GATE Wallah2023
[Note: there is no break after case 3]

5. (d)

```
j=10;
switch(10)
{
  case 1: p+=3;
  case 2: p+=5;
  break;
  default: p-=8;//p= 0 - 8= -8
  case 3: p-=7;//p= -8 -7 = -15
  break;
}
 j=j-3;//j=7
 printf("%d\t",p); // -15
 j=7;
 switch(7)
{
  case 1: p+=3;
  case 2: p+=5;
  break;
  default: p-=8;//p= -15 - 8= -23
  case 3: p-=7;//p= -23 -7 = -30
  break;
}
 j=j-3;//j=4
 printf("%d\t",p); // -30
 j=4;
 switch(4)
{
  case 1: p+=3;
  case 2: p+=5;
  break;
```

default: p-=8;//p= -30 - 8= -38
case 3: p-=7;//p= -38 -7 = -45
break;
}
j=j-3;//j=1
printf("%d\t",p); // -45
j=1;
switch(1)
{
  case 1: p+=3; //p= -45 +3 =-42
  case 2: p+=5; //p = -42 + 5 =-37
  break;
  default: p-=8;
  case 3: p-=7;
  break;
}
j=j-3;//j=-2
printf("%d\t",p); // -37
Output: -15 -30 -45 -37

6. **(69)**
x=0; 0<32 -> TRUE
switch(0){
  case 0: x= x+2;//x=0+2=2
  case 1: x=x+5;//x=2+5=7
  case 2: x=x+1;//x=7+1=8
  default: x=x+7;//x=8+7=15
}
printf("%d\t",x);//15 is printed
x is incremented to 16.
x=16; 16<32-> TRUE
switch(16)
{
  case 0: x= x+2;
  case 1: x=x+5;

case 2: x=x+1;
  default: x=x+7;//x=16+7=23
}
printf("%d\t",x);//23 is printed
x is incremented to 24.
x=24; 24<32-> TRUE
switch(24)
{
  case 0: x= x+2;
  case 1: x=x+5;
  case 2: x=x+1;
  default: x=x+7;//x=24+7=31
}
printf("%d\t",x);//31 is printed
x is incremented to 32.
32<32 is FALSE. Execution stops.
Sum of printed values= 15+23+31=69

7. **(b)**
P: INCORRECT. Case label can never be floating point numbers.
Q: CORRECT. Only one default is allowed in switch-case structure.

8. **(b)**
x=4, y=5
x=x==y==5;
x==y is 0 and 0==5 is 0.
So x=x==y==5 is equivalent to x=0.
The switch is never executed here.
So, printf("%d", ++x) increments x to 1 and prints it.
Output: 1