

# 19 CSE 102 Computer Programming

## LAB 2 - PART 1- OPERATORS AND DECISION MAKING

1. Find the output of the following program

```
1  #include <stdio.h>
2  int main()
3  {
4      int a = 10, b = 4;
5      // greater than example
6      if (a > b)
7          printf("a is greater than b\n");
8      else
9          printf("a is less than or equal to b\n");
10     // not equal to
11     if (a != b)
12         printf("a is not equal to b\n");
13     else
14         printf("a is equal b\n");
15     return 0;
16 }
```

2. Find the output of the following program

```
1  #include <stdio.h>
2  int main()
3  {
4      int a = 10, b = 4, c = 10, d = 20;
5      if (a > b && c == d)
6          printf("a is greater than b AND c is equal to d\n");
7      else
8          printf("AND condition not satisfied\n");
9      if (a > b || c == d)
10         printf("a is greater than b OR c is equal to d\n");
11     else
12         printf("Neither a is greater than b nor c is equal "
13             " to d\n");
14     if (!a)
15         printf("a is zero\n");
16     else
17         printf("a is not zero");
18     return 0;
19 }
```

3. Find the output of the following program and explain the reason leading to the output

```
1  #include<stdio.h>
2  int main()
3  {
4      int a = 10, b = 4;
5      int res = ((a == b) && printf("Namaste"));
6      printf("%d",res);
7      return 0;
8  }
```

4. Find the output of the following program and explain the reason leading to the output

```
1  #include<stdio.h>
2  int main()
3  {
4      int a = 10, b = 4;
5      int res = ((a != b) && printf("Namaste\n"));
6      printf("%d",res);
7      return 0;
8  }
```

5. Find the output of the following program and explain the reason leading to the output

```
1  #include <stdio.h>
2  int main()
3  {
4      int a = 10, b = 4;
5      int res = ((a != b) || printf("Namaste\n"));
6      printf("%d",res);
7      return 0;
8  }
```

6. Find the output of the following program and explain the reason leading to the output

```
1  #include <stdio.h>
2  int main()
3  {
4      int a = 10, b = 10;
5      int res = ((a != b) || printf("Namaste\n"));
6      printf("%d",res);
7      return 0;
8  }
```

7. Find the output of the following program and explain the reason leading to the output

```
1  #include <stdio.h>
2  int main()
3  {
4      int a = 10, b = 20, c = 30;
5      if (c > b > a)
6          printf("TRUE");
7      else
8          printf("FALSE");
9      return 0;
10 }
```

8. Find the output of the following program and explain the reason leading to the output

```
1  #include <stdio.h>
2  int main()
3  {
4      int a = 10, b = 20;
5      printf("%d\n",a<<1);
6      printf("%d",b<<2);
7      return 0;
8  }
```

9. Find the output of the following program and explain the reason leading to the output

```
1  #include <stdio.h>
2  int main()
3  {
4      int a = 10, b = 20;
5      printf("%d\n",a>>1);
6      printf("%d",b>>2);
7      return 0;
8  }
```

10. Find the output of the following program and explain the reason leading to the output

```
1  #include <stdio.h>
2  int main()
3  {
4      int a = 10;
5      char b = 'a';
6      printf("%d\n",sizeof(a));
7      printf("%d\n",sizeof(b));
8      printf("%d",sizeof(printf("Himalayas")));
9      return 0;
10 }
```

11. Find the output of the following program and explain the reason leading to the output

```
1  #include <stdio.h>
2  int main()
3  {
4      int a = 10, b = 10;
5      printf("%d\n",a++);
6      printf("%d\n",a);
7      printf("%d\n",++b);
8      printf("%d",b);
9      return 0;
10 }
```

12. Find the output of the following program and explain the reason leading to the output

```
1  #include <stdio.h>
2  int main()
3  {
4      int a = 1;
5      int b = 1;
6      int c = a || --b;
7      int d = a-- && --b;
8      printf("a = %d, b = %d, c = %d, d = %d", a, b, c, d);
9      return 0;
10 }
```

13. Find the output of the following program and explain the reason leading to the output

```
1  #include <stdio.h>
2  int main()
3  {
4      printf("%d", 1 << 2 + 2 << 4);
5      return 0;
6  }
```

14. Find the output of the following program and explain the reason leading to the output

```
1  #include <stdio.h>
2  int main()
3  {
4      int i = 12;
5      int j = sizeof(i++);
6      printf("%d\n%d", i, j);
7      return 0;
8  }
```

15. Find the output of the following program and explain the reason leading to the output

```
1  #include <stdio.h>
2  int main()
3  {
4      int i = 4;
5      int j = 5;
6      printf("%d\n", i^j);
7      printf("%d", i^(--j));
8      return 0;
9  }
```

16. Find the output of the following program and explain the reason leading to the output

```
1  #include<stdio.h>
2  int main()
3  {
4      int a = 2,b = 5;
5      a = a^b;
6      b = b^a;
7      printf("%d\n%d",a,b);
8      return 0;
9  }
```

17. Given the code to swap two variables without a third variable using + and – operators. Can you try to write a code to swap variables without using a third variable using the ^ operator.

18. Find the output of the following program and explain the reason leading to the output

```
1  #include <stdio.h>
2  int main()
3  {
4      int a = 0;
5      int b;
6      a = (a == (a == 1));
7      printf("%d", a);
8      return 0;
9  }
```

19. Find the output of the following program and explain the reason leading to the output

```
1  #include <stdio.h>
2  int main()
3  {
4      int i = 0, j = 1, k = -1;
5      float a;
6      float x = 0.5, y = 0.0;
7      a = x * y < i + j || k ;
8      printf("%f", a);
9      return 0;
10 }
```

20. Which BITWISE operator is to be used in line number 7 for the value in variable 'c' to be 6? What is the value in variable 'z'?

```
1  #include <stdio.h>
2  int main()
3  {
4      int x = 4;
5      int y = 6;
6      int z = x&y;
7      int c = x y;
8      printf("%d\n%d", z, c);
9      return 0;
10 }
```



21. Akshay and Rohith are playing a game. The game is such that Akshay has to find out the number in a series of 5 numbers which are given by Rohith (all the numbers are greater than 0). Now, out of the 5 numbers only one number is not a duplicate of any other number, i.e every other number except one number has a duplicate. Help Akshay write a program that finds the number not having a duplicate and displays the same as the output. [Please understand that you are not supposed to use == operator or loops or an array(s) or any built in function other than printf and scanf]

**Input**

4  
6  
10  
4  
6

**Output**

10

22. Nivedita and Hima are playing a game to determine whether a number mentioned by Hima is even or odd. However, Nivedita is not supposed to use /, %, - or + operators. Help Nivedita to write a program that can determine whether the number mentioned by Hima is even or odd

**Input**

4

**Output**

Even

23. Find the output of the following program and explain the reason leading to the output

```
1  #include<stdio.h>
2  int main()
3  {
4      int a = 7, b = 4, c = 2;
5      printf("%d\n", a|b&c);
6      return 0;
7  }
```