Minor Assignment - 1

Basic Elements of Python Programming

Q1) Evaluate the following expressions:

(x < y) or (not (z == y) and (z < x))

a) x = 0, y = 6, z = 10

b) x = 1, y = 1, z = 1

Program :-

```
x = int (input ("Input x : "))
y = int (input ("Input y : "))
z = int (input ("Input z : "))
print (x < y) or (not (z == y) and (z < x)))
```

Output

a) Input x : 0
Input y : 6
Input z : 10
True

b) Input x : 1
Input y : 1
Input z : 1
False

Q2) Evaluate the following expressions involving arithmetic operators:

a) -7 * 20 + 8 / 16 * 2 + 54

b) 7 ** 2 // 9 % 3

c) (7 - 4 * 2) * 10 - 25 * 8 // 5

d) 5 % 10 + 10 - 25 * 8 // 5

e) 'hello' * 2 - 5

Program :-

```
print (-7 * 20 + 8 / 16 * 2 + 54)
print (7 ** 2 // 9 % 3)
print ((7 - 4 * 2) * 10 - 25 * 8 // 5)
print (5 % 10 + 10 - 25 * 8 // 5)
```

```
print('hello' * 2 - 5)
```

Output :

```
-85.0
2
-50
-25
Exception has occured : TypeError
  unsupported operand type(s) for -: 'str' and 'int'
```

Q3) Evaluate the following expressions involving relational and logical operators :

a) 'hi' > 'hello' and 'bye' < 'Bye'

b) 'hi' > 'hello' or 'bye' < 'Bye'

c) 7 > 8 or 5 < 6 and 'I am fine' > 'I am not fine'

d) 10 != 9 and 29 >= 29

e) 10 != 9 and 29 >= 29 and 'hi' > 'hello' or 'bye' < 'Bye' and 7 <= 2.5

Program :-

```
print ('hi' > 'hello' and 'bye' < 'Bye')
print ('hi' > 'hello' or 'bye' < 'Bye')
print (7 > 8 or 5 < 6 and 'I am fine' > 'I am not fine')
print (10 != 9 and 29 >= 29)
print (10 != 9 and 29 >= 29 and 'hi' > 'hello' or 'bye' < 'Bye'
                                                and 7 <= 2.5)
```

Output :-

```
False
True
False
True
True
```

Q4) Evaluate the following expressions involving arithmetic, relational and logical operators:

a) 5 % 10 + 10 < 50 and 29 >= 29

b) 7 ** 2 <= 5 // 9 % 3 or 'bye' < 'Bye'

c) 5 % 10 < 8 and -25 > 1 * 8 // 5

d) 7 ** 2 // 4 + 5 > 8 or 5 != 6

e) 7/4 < 6 and 'I am fine' > 'I am not fine'

f) 10 + 6 * 2 ** 2 != 9 // 4 - 3 and 29 >= 29/9

g) 'hello' * 5 > 'hello' or 'bye' < 'Bye'

Program :-

```
print("solution A", 5%10 + 10 < 50 and 29 >= 29)
print("solution B", 7 ** 2 <= 5 // 9 % 3 or 'bye' < 'Bye')
print("solution C", 5% 10<8 and -25 > 1 * 8 // 5)
print("solution D", 7**2 // 4+5 > 8 or 5!=6)
print("solution E", 7/4 < 6 and 'I am fine' > 'I am not fine')
print("solution F", 10+6*2**2 != 9 // 4 - 3 and 29 >= 29/9)
print("solution G", 'hello' * 5 > 'hello' or 'bye' < 'Bye')
```

Output :-

Solution A True
Solution B False
Solution C False
Solution D True
Solution E False
Solution F True
Solution G True.

Q5) Evaluate the following expressions involving bitwise operators :

a) 15 & 22
b) 15 | 22
c) ~15 & 22
d) ~15 | 22
e) ~15
f) ~22
g) ~-20
h) 15 ^ 22
i) 8 << 3
j) 40 >> 3

Program :-

```
print (15 & 22)
print (15 | 22)
print (-15 & 22)
print (-15 | 22)
print (~15)
print (~22)
print (~-20)
print (15 ^ 22)
print (8 << 3)
print (40 >> 3)
```

Output :-

```
6
31
16
-9
-16
-23
 19
 25
 64
  5
```

Q6) Differentiate between the following operators with the help of examples:

a) = and ==

b) / and %

c) / and //

d) * and **

Program :-

```
''' = is an assignment operator
== is an equality operator'''
x = 10
y = 20
z = 20
print (x == y)
print (y == z)
```

```
'''/ is a division operator
// is a floor division operator'''
print (9/5)
print (9//5)

'''/ is a division operator
% is a modulus operator'''
print (10/3)
print (10%5)

'''* is a multiplication operator
** is an exponentiation operator'''
print (10*2)
print (10**2)
```

Output :-

```
False
True
1.8
1
2.0
0
20
100
```

Q7) What output will be displayed when the following commands are executed in Python shell in sequence:

a)
```
>>> a=6
>>> a==6
>>> a<5.9
>>> a>5.9
```

b)
```
>>> b=7
>>> b/6
>>> b//6
>>> b/4
>>> b%4
>>> b%7
```

```
>>> b*2
>>> b**2
```

(Ans).
```
>>> a=6
>>> a==6
True
>>> a<5.9
False
>>> a>5.9
True
>>> b=7
>>> b/6
1.1666666666666667
>>> b//6
1
>>> b/4
1.75
>>> b%4
3
>>> b%7
0
>>> b*2
14
>>> b**2
49
```

Q8) construct logical expressions for representing the following conditions.

a) Marks scored should be greater than 300 & less than 400.

b) whether the value of grade ..... is an uppercase letter.

c) The post is engineer and experience is more than four years.

Program :-

```
marks= int(input("Enter marks: "))
if(marks >300 and marks<400):
    print("True")
letter = (input("Enter character: "))
if( letter.isupper()):
    print("True")
```

```
post = (input ("Enter post: "))
experience = int (input ("Enter experience year: "))
if (post == 'engineer' and experience > 4):
    print ("True")
```

Output :-

```
Enter marks: 350
True
Enter character: A
True
Enter post: engineer
Enter experience : 5
True.
```

6a) write Python statements for the following equations:

a) $root1 = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

b) $result = \frac{2xy - 9y}{2xy^3} - \frac{4yx^2}{2y}$

c) $result = 2\cos\frac{1}{2}(x+y)\cos\frac{1}{2}(x-y) + e^x - 1 - \frac{x}{4} + \tan x - \log(v)$

Program :-

```
import math
a = int (input ("Enter a "))
b = int (input ("Enter b "))
c = int (input ("Enter c "))
d = (b**2) - (4*a*c)
root1 = (-b - math.sqrt (d))/(2*a)
root2 = (-b + math.sqrt (d))/(2*a)
print ('the solution are {} and {}', format (root1, root2))
x = int (input ("Enter x "))
y = int (input ("Enter y "))
result = (((2*x*y) - (9*y))/(2*x*(y**3))) - ((4*y*(x**2)) - (2*y))
print(result).
```

```
x = int(input("Enter x"))
y= int(input("Enter y"))
v= int(input("Enter v"))
result = (2* math.cos(0.5*(x+y))* math.cos(0.5*(x-y)))
        + math.e**x - 1 + (x/4)+ math.tan(x)- math.log(v)
```

Q10) How does the effect of the following two statements differ?

a) x += x+10

b) x = x+10

Program:-

```
x= int(input("Enter x:"))
a = x
x += x + 10
print(x)
x=a
x = x + 10
print(x)
```

output:-

```
Enter x : 10
20
20
```