

# QB365 Question Bank Software Study Materials

## Lists, Tuples, Sets and Dictionary Important 2, 3 & 5 Marks Questions With Answers (Book Back and Creative)

12th Standard

Computer Science

Total Marks : 75

### 2 Marks

10 x 2 = 20

1) What is List in Python?

**Answer :** A list in Python is known as a "Sequence data type" like strings. It is an ordered collection of values enclosed within square brackets [ ]. Each value of a list is called as element.

2) How will you access the list elements in reverse order?

**Answer :** Python enables reverse or negative indexing for the list elements. Thus, python lists index in opposite order. The python sets -1 as the index value for the last element in list and -2 for the preceding element and so on. This is called as Reverse Indexing.

3) What will be the value of x in following python code?

```
List 1 = [2, 4, 6[1, 3, 5]]
x = len (List 1)
```

**Answer :** 4

4) Differentiate del with remove( ) function of List.

**Answer :**

	del function	remove () function
(i)	del statement is used to delete elements whose index is known.	move() function is used to delete elements of a list if its index is unknown.
(ii)	The del statement can also be used to delete entire list.	The remove () function can be used to delete one or more elements if the index value is not known.

5) Write the syntax of creating a Tuple with n number of elements.

**Answer : Syntax:**

```
# Tuple with n number elements
Tuple_Name (E1, E2, E3.....En)
# Elements of a tuple without parenthesis
Tuple_Name = E1, E2, E3 ..... En
```

6) What is set in Python?

**Answer :** (i) In Python, a set is another type of collection data type. A'Set is a mutable and an unordered collection of elements without duplicates.

(ii) That means the elements within a set cannot be repeated. This feature used to include membership testing and eliminating duplicate elements.

7) What is the use of len ( ) function?

**Answer :** The len ( ) function in Python is used to find the length of a list. It is used to set the upper limit in a loop to read all the elements of a list. If a list contains another list as an element, len ( ) returns that inner list as a single element.

8) What is index ( ) function artd write its syntax?

**Answer :** index( ) function returns the index value of the first recurring element.

**Syntax:**

List.index(element)

9) What is nested tuples?

**Answer :** In Python, a tuple can be defined inside another tuple; called Nested tuple. In a nested tuple, each tuple is considered as an element.

10) Flow insert ( ) function will perform

**Answer :** While inserting a new element in between the existing elements, at a particular location, the existing elements shift one position to the right.

**3 Marks**

10 x 3 = 30

11) What are the advantages of Tuples over a list?

**Answer :** (i) The elements of a list are changeable (mutable) whereas the elements of a tuple are unchangeable (immutable), this is the key difference between tuples and list.

(ii) The elements of a list are enclosed within square brackets[ ]. But the elements of a tuple are enclosed by parenthesis().

(iii) Iterating tuples is faster than list.

12) Write a shot note about sort( ).

**Answer : Sort ( ) :**

It sorts the element in list.

**Syntax :**

```
List.sort(reverse=True | False,key=myfunc)
```

**Sorts the element in list :**

Both arguments are optional

(i) If reverse is set as True, list sorting is in descending order.

(ii) Ascending is default.

(iii) Key=myFunc; "myFunc" - the name of the user defined function that specifies the sorting criteria.

**Example :**

```
MyList = ['Thilothamma', 'Tharani', 'Anitha','SaiSree', 'Lavanya')
```

```
MyList.sort( )
```

```
print(MyList)
```

```
MyList.sort(reverse=True)
```

```
print(MyList)
```

**Output :**

```
['Anitha', 'Lavanya', 'SaiSree', 'Tharani', 'Thilothamma']
```

```
['Thilothamma', 'Tharani', 'SaiSree', 'Lavanya', 'Anitha']
```

13) What will be the output of the following code?

```
list = [2**x for x in range(5)]
```

```
print (list)
```

**Answer :** Output: [1,2,4,8,16]

14) Explain the difference between del and clear( ) in dictionary with an example.

**Answer :**

	<b>del</b>	<b>Clear( )</b>
(i)	The del statements is used to delete elements whose index is known.	The function clear ( ) is used to delete all the elements in list.
(ii)	The del statement can also be used to delete entire list.	It deletes only the elements and retains the list.
(iii)	Example: del Dict ["MarkT"]	Example : Dict.clear( )

15) List out the set operations supported by python.

**Answer : Set Operations :**

**(i) Union :** It includes all elements from two or more sets.

**(ii) Intersection :** It includes the common elements in two sets.

**(iii) Difference :** It includes all elements that are in first set (say set A) but not in the second set (say set B).

**(iv) Symmetric difference :** It includes all the elements that are in two sets (say sets A and B) but not the one that are common to two sets.

16) What are the difference between List and Dictionary?

**Answer :** (i) List is an ordered set of elements. But, a dictionary is a data structure that is used for matching one element (Key) with another (Value).

(ii) The index values can be used to access a particular element. But, in dictionary key represents index. Remember that, key may be a number of a string.

(iii) Lists are used to look up a value whereas a dictionary is used to take one value and look up another value.

17) Write a program to define a list of countries that are a member of BRICS. Check whether a county is member of BRICS or not.

**Answer :** `country=["India", "Russia", "Srilanka", "China", "Brazil"]`

`is_member = input("Enter the name of the country: ")`

`if is_member in country:`

`print(is_member, " is the member of BRICS")`

`else:`

`print(is_member, " is not a member of BRICS")`

**Output:**

Enter the name of the country: India

India is the member of BRICS

**Output:**

Enter the name of the country: Japan

Japan is not a member of BRICS

18) Write a note on the following function used in list.

**Answer :**

<code>max( )</code>	Returns the maximum value in a list	<code>max (list)</code>	<code>MyList=[21, 76, 98, 23]</code> <code>print(max(MyList))</code> <b>Output:</b> 98
<code>min( )</code>	Returns the minimum value in a list.	<code>min (list)</code>	<code>MyList=[21, 76, 98, 23]</code> <code>print(min(MyList) )</code> <b>Output:</b> 21
<code>sum( )</code>	Returns the sum of values in a list.	<code>sum (list)</code>	<code>MyList=[21, 76, 98, 23]</code> <code>print(sum(MyList) )</code> <b>Output:</b> 218

19) How will you insert an element in a list? Give an example

**Answer :** If we want to include an element at our desired position, we can use insert() function. The insert() function is used to insert an element at any position of a list.

**Syntax:**

```
List.insert(position index, element)
```

**Example:**

```
> > Mylist= [34, 98, 47,' Kannan', 'sankar', 'Lenin']
> > > print(Mylist)
[34, 98, 47, 'Kannan', 'sankar', 'Lenin']
> > > Mylist.insert(3, 'Ramakrishnan')
> > > print(Mylist)
[34, 98, 47, 'Ramakrishnan', 'Kannan', 'sankar', 'Lenin']
```

insert() function inserts a new element 'Ramakrishnan' at the index value 3, i.e. at the 4<sup>th</sup> position. While inserting a new element in between the existing elements, at a particular location, the existing elements shifts one position to the right.

20) Explain how will you change the elements in a list.

**Answer :** In Python, the lists are mutable, which means they can be changed. A list element or range of elements can be changed or altered by using simple assignment operator (=).

**Syntax:**

```
List_variable [index of an element] = value to be changed.
```

```
List_variable [index from: index to]= values to changed.
```

Where, index from is the beginning index of the ranges index to is the upper limit of the range which is excluded in the range.

For example,if we set the range [0:5] means, Python takes only 0 to 4 as element index. Thus, if we want to update the range of elements from 1 to 4, it should be specified as [1:5].

**5 Marks**

5 x 5 = 25

21) What the different ways to insert an element in a list. Explain with suitable example.

**Answer : Inserting elements in a list using insert ( ) :**

(i) append ( ) function in Python is used to add more elements in a list. But, it includes elements at the end of a list.

(ii) If you want to include an element at your desired position, you can use insert ( ) function. The insert ( ) function is used to insert an element at any position of a list.

**Syntax :**

```
List.insert (position index, element)
```

**Example :**

```
> > > MyList=[34,98,47, Kannan,Gowrisankar','Lenin', 'Sreenivasan' ]
> > > print(MyList)
[34, 98, 47, 'Kannan', 'Gowrisankar', 'Lenin', 'Sreenivasan']
> > > MyList.insert(3, 'Ramakrishnan')
> > > print(MyList)
[34, 98, 47, 'Ramakrishnan', 'Kannan', 'Gowrisankar', 'Lenin', 'Sreenivasan']
```

**Output :** [34, 98, 47, 'Ramakrishnan', 'Kannan', 'Gowrisankar', 'Lenin', 'Sreenivasan']

(i) In the above example, insert() function inserts a new element 'Ramakrishnan' at the index value 3, ie. at the 4th position.

(ii) While inserting a new element in between the existing elements, at a particular location, the existing elements shifts one position to the right.

22) What is the purpose of range( )? Explain with an example.

**Answer :** The range( ) is a function used to generate a series of values in Python. Using range( ) function, you can create list with series of values. The range( ) function has three arguments.

**Syntax:**

```
range (start value, end value, step value)
```

where,

- (i) **start value** - beginning value of series. Zero is the default beginning value.
- (ii) **end value** - upper limit of series. Python takes the ending value as upper limit - 1.
- (iii) **step value** - It is an optional argument, which is used to generate different interval of values.

**Example:**

Generating whole numbers upto 10.

```
for x in range (1,11):
```

```
print(x)
```

**Output:**

```
1
2
3
4
5
6
7
8
9
10
```

**Creating a list with series of values :**

(i) Using the range( ) function, a list can be created with series of values, To convert the result of range( ) function into list, one more function called list ( ). The list ( ) function makes the result of range ( ) as a list.

(ii) Syntax: List\_Varibale = list ( range ( ) )

**(iii) Example**

Generating first 10 even numbers

```
for x in range (2, 11, 2):
```

```
print (x)
```

**Output:**

```
2
4
6
8
10
```

(iv) In the above code, list( ) function takes the result of range( ) as Even\_List elements. Thus, Even\_List list has the elements of first five even numbers. Similarly, we can create any serie of values using range( ) function. The following example explains how to create a list with squares of first 10 natural numbers.

**Example :** Generating squares of first 10 natural numbers

```
for x in range(1,11) :
```

```
    S=x**2
```

```
    squares.append(s)
```

```
print (squares)
```

**Output :** [1, 4, 9, 16, 25, 36, 49, 64, 81, 100]

23) What is nested tuple? Explain with an example.

**Answer :** In Python, a tuple can be defined inside another tuple; called Nested tuple. In a nested tuple, each tuple is considered as an element. The for loop will be useful to access all the elements in a nested tuple.

**Example:**

```
Toppers = (("Vinodini", "XII-F", 98.7), ("Soundarya", "XII-H", 97.5),  
("Tharani", "XII-F", 95.3), ("Saisri", "XII-G", 93.8))  
for i in Toppers:  
print(i)
```

**Output:**

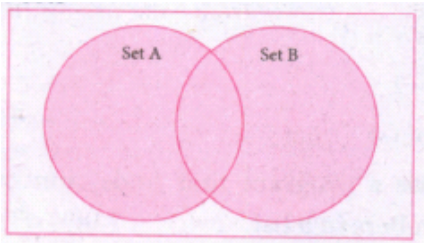
```
('Vinodini', 'XII-F', 98.7)  
(Soundarya', 'XII-H', 97.5)  
(Tharani', 'XII-F', 95.3)  
(Saisri', 'XII-G', 93.8)
```

- 24) Explain the different set operations supported by python with suitable example.

**Answer :** The python supports the set operations such as Union, Intersection, difference and Symmetric difference.

**i) Union:**

It includes all elements from two or more sets



In python, the operator | is used to union of two sets. The function union ( ) is also used to join two sets in python.

**Example:**

Program to Join (Union) two sets using union operator

```
set_A={2,4,6,8}
set_B={'A', 'B', 'C', 'D'}
U_set=set_A | set_B
print (U_set)
```

**Output:**

{2, 4, 6, 8, 'A', 'D', 'C', 'B'}

**Example:**

Program to Join (Union) two sets using union function.

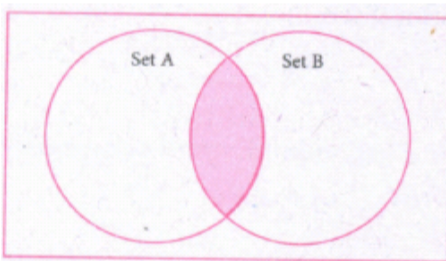
```
set_A={2,4,6,8}
set_B={'A', 'B', 'C', 'D'}
set_U=set_A.Union(set_B)
print(set_U)
```

**Output:**

{'D', 2, 4, 6, 8, 'B', 'C', 'A'}

**ii) Intersection:**

(i) It includes the common elements in two sets



The operator & is used to intersect two sets in python. The function intersection( ) is also used to intersect two sets in python.

**Example:**

Program to insert two sets using intersection operator

```
set_A={'A', 2, 4, 'D'}
set_B={'A', 'B', 'C', 'D'}
print(set_A & set_B)
```

**Output:**

{'A', 'D'}

**Example:**

Program to insert two sets using intersection function

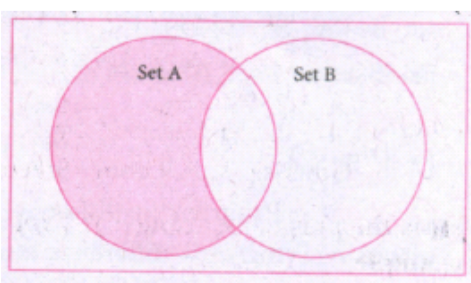
```
set_A={'A', 2, 4, 'D'}
set_B={'A', 'B', 'C', 'D'}
print( set_A.intersection(set_B))
```

**Output:**

{'A', 'D'}

**iii) Difference**

It includes all elements that are in first set (say set A) but not in the second set (say set B)



The minus (-) operator is used to difference set operation in python. The function difference() is also used to difference operation.

**Example:**

Program to difference of two sets using minus operator

```
set_A={'A', 2, 4, 'D'}
```

```

set_A={1, 2, 4, 10}
set_B={'A', 'B', 'C', 'D'}
print(set_A - set_B)

```

**Output**

{2,4}

**Example:**

Program to difference of two sets using difference function

```

set_A={'A', 2, 4, 'D'}
set_B={'A', 'B', 'C', 'D'}
print(set_A.difference( set_B))

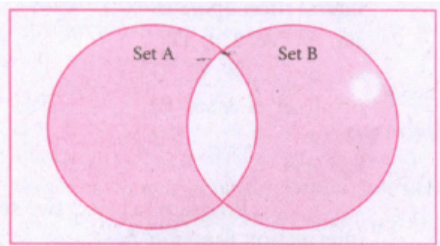
```

**Output:**

{2,4}

**iv) Symmetric difference:**

It includes all the elements that are in two sets (say sets A and B) but not the one that are common to two sets.



The caret (^) operator is used to symmetric difference set operation in python. The function symmetric\_difference( ) is also used to do the same operation.

**Example:**

Program to symmetric difference of two sets using caret operator

```

set_A={'A', 2, 4, 'D'}
set_B={'A', 'B', 'C', 'D'}
print(set_A ^ set_B)

```

**Output:**

{2, 4, 'B', 'C'}

**Example:**

Program to difference of two sets using symmetric difference function

```

set_A={'A', 2, 4, 'D'}
set_B={'A', 'B', 'C', 'D'}
print( se_A.symmetric_ difference (set_B))

```

**Output:**

{2, 4, 'B', 'C'}

25) Explain in detail about tuples assignment.

**Answer :** Tuple assignment is a powerful feature in Python. It allows a tuple variable on the left of the assignment operator to be assigned to the values on the right side of the assignment operator. Each value is assigned to its respective variable.

**Example:**

```

>>> (a, b, c) = (34, 90, 76)
>>> print(a, b, c)
34, 90, 76
#expression are evaluated before assignment.
>>> (x, y, z, p) = (2**2, 5/3 + 4, 15% 2, 34 > 65)
>>> print (x, y, z, p)
4.5666666666666671 False.

```

When we assign values to a tuple, ensure that the number of values on both sides of the assignment operator are same, otherwise, an error is generated by Python.