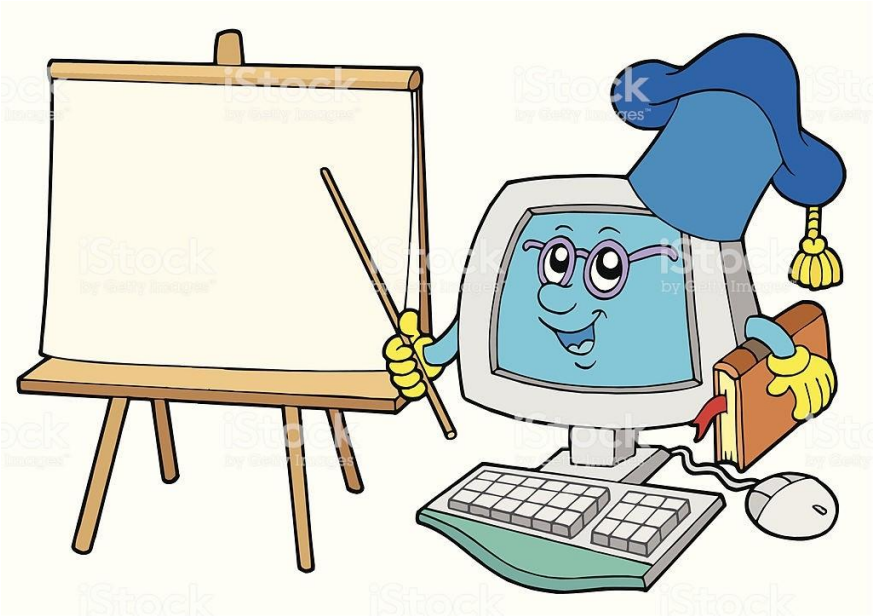
HIGHER SECONDARY SECOND YEAR

COMPUTER SCIENCE

UNIT III - Modularity and OOPS

BOOK BACK QUESTION & ANSWERS

2024 - 25



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CHAPTER 9: Lists, Tuples, Sets and Dictionary

Choose the best answer: (1 Mark)

1. Pick odd one in connection with collection data type
   (A) List (B) Tuple (C) Dictionary **(D) Loop**
2. Let list1=[2,4,6,8,10], then print(List1[-2]) will result in
   (A) 10 **(B) 8** (C) 4 (D) 6
3. Which of the following function is used to count the number of elements in a list?
   (A) count() (B) find() **(C) len()** (D) index()
4. If List=[10,20,30,40,50] then List[2]=35 will result
   (A) [35,10,20,30,40,50] (B) [10,20,30,40,50,35]
   (C) [10,20,35,40,50] (D) [10,35,30,40,50]
5. If List=[17,23,41,10] then List.append(32) will result
   (A) [32,17,23,41,10] **(B) [17,23,41,10,32]**
   (C) [10,17,23,32,41] (D) [41,32,23,17,10]
6. Which of the following Python function can be used to add more than one element within anexisting list?
   (A) append() (B) append_more() **(C) extend()** (D) more()
7. What will be the result of the following Python code? S=[x**2 for x in range(5)]
   print(S)
   (A) [0,1,2,4,5] **(B) [0,1,4,9,16]** (C) [0,1,4,9,16,25] (D) [1,4,9,16,25]
8. What is the use of type() function in python?
   (A) To create a Tuple
   (B) To know the type of an element in tuple.
   (C) To know the data type of python object.
   (D) To create a list.
9. Which of the following statement is not correct?
   (A) A list is mutable (B) A tuple is immutable.
   (C) The append() function is used to add an element.
   (D) The extend() function is used in tuple to add elements in a list.
10. Let setA={3,6,9}, setB={1,3,9}. What will be the result of the following snippet?print(setA|setB)
    (A) {3,6,9,1,3,9} (B) {3,9} (C) {1} **(D) {1,3,6,9}**
11. Which of the following set operation includes all the elements that are in two sets but not the onethat are common to two sets?
    (A) Symmetric difference (B) Difference (C) Intersection (D) Union
12. The keys in Python, dictionary is specified by
    (A) = (B) ; (C)+ **(D) :**

Answer the following questions: (2 Marks)

1. **What is List in Python?**
   - A list is an ordered collection of values enclosed within square brackets [ ] also known as a 'sequence data type'.
   - Each value of a list is called as element.
   - Elements can be a numbers, characters, strings and even the nested lists.

   Syntax: Variable = [element-1, element-2, element-3 …… element-n]
2. **How will you access the list elements in reverse order?**
   - A negative index can be used to access an element in reverse order.
3. **What will be the value of x in following python code?**

   List1=[2,4,6[1,3,5]]

   x=len(List1)

   Output: 4
4. **Differentiate del with remove() function of List.**

del	remove( )
del statement is used to delete known elements	**remove( )**function is used to delete elements of a list if its index is unknown.

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

   Syntax: **Tuple_Name = (E1, E2, E2 ……. En)** Or
   Tuple_Name = E1, E2, E3 ….. En
6. **What is set in Python?**
   - In python, a set is another type of collection data type.
   - A Set is a mutable and an unordered collection of elements without duplicates or repeated element.

Answer the following questions: (3 Marks)

1. **What are the difference between list and Tuples?**
   - 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.
   - The elements of a list are enclosed within square brackets. But, the elements of a tuple are enclosed by parenthesis.
   - Iterating tuples is faster than list.
2. **Write a shot note about sort().**
   - Sort() function sorts the element in list.

   Syntax : List.sort(reverse=True/False, key=myFunc)
   - If reverse is set as True, list sorting is in descending order. Ascending is default.

3. **What will be the output of the following code?**

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

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

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

del	clear( )
The **del** statement is used to delete known elements	The function **clear( )** is used to delete all the elements in list
The del statement can also be used to delete entire list.	It deletes only the elements and retains the list.

Ex: >>> MySubjects = ['Tamil', 'English']
>>> del MySubjects[1]
>>> print (MySubjects)
Output: ['Tamil']
	Ex: >>> MySubjects = ['Tamil', 'English']
	>>> MySubjects.clear()
	>>> print (MySubjects)
	Output: [ ]

5. **List out the set operations supported by python.**

- **Union (U):** It includes all elements from two or more sets.
- **Intersection (&):** It includes the common elements in two sets.
- **Difference (-):** It includes all elements that are in first set but not in the second set.
- **Symmetric difference (^):** It includes all the elements that are in two sets but not the one that are common to two sets.

6. **What are the difference between List and Dictionary?**

List	Dictionary
List is an ordered set of elements.	Dictionary is a data structure that is used for matching one element (Key) with another (Value).
The index values can be used to access a particular element.	In dictionary key represents index.
Lists are used to look up a value	dictionary is used to take one value and look up another value.

Answer the following questions: (5 Marks)

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

- **append():** The **append( )**function is used to add a single element at the end of a list.

Syntax: List.append (element to be added)

Example:
```
>>> Mylist=[34, 45, 48]
>>> Mylist.append(90)
>>> print(Mylist)
```

Output: [34, 45, 48, 90]

- **extend():** The **extend( )**function is used to add more than one element to an existing list.

Syntax: List.extend ([elements to be added])

Example:
```
>>> Mylist=[34, 45, 48]
>>> Mylist.extend([71, 32, 29])
>>> print(Mylist)
```

Output: [34, 45, 48, 90, 71, 32, 29]

- **insert():** 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', 'Sreenivasan' ]
>>> MyList.insert(3, 'Ramakrishnan')
>>> print(MyList)
```

Output: [34,98,47,'Ramakrishnan','Kannan',’Sankar', 'Lenin', 'Sreenivasan']

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

- Using range( ) function, we can create list with series of values.
- The range( ) function has three arguments.

Syntax: range (start value, end value, step value)

- **start value** – beginning value of series.
- **end value** – upper limit of series.
- **step value** – It is an optional argument, which is used to generate different interval of values.

Example :
```
for x in range (2, 11,2):
        print(x, end=’ ‘)
```

Output: 2 4 6 8 10

3. **What is nested tuple? Explain with an example.**

- 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 = (("Vinothini", "XII-F", 98.7), ("Tharani", "XII-F", 95.3))
for i in Toppers:
        print(i)
```

Output:
```
('Vinodini', 'XII-F', 98.7)
('Tharani', 'XII-F', 95.3)
```

4. Explain the different set operations supported by python with suitable example.

- **Union:** It includes all elements from two or more sets. The **operator |** is used to union of two sets.

Example:
```
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'}

- **Intersection:** It includes the common elements in two sets. The **operator &** is used to intersect two sets in python.

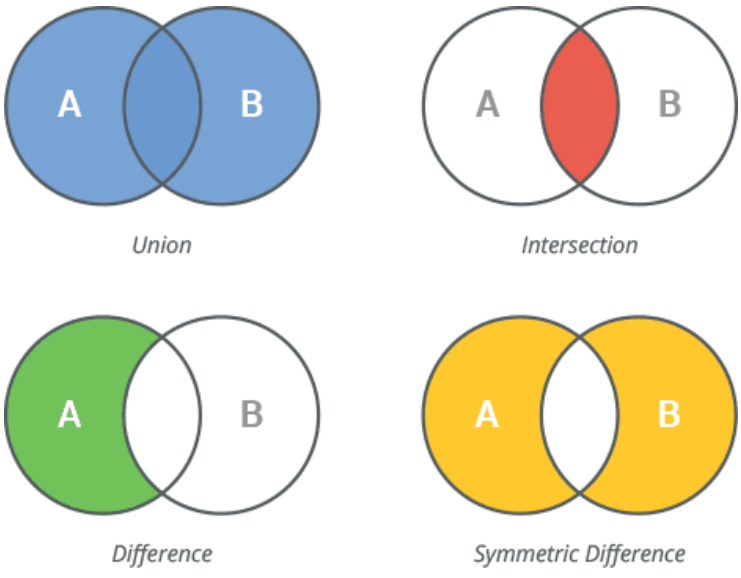
Example:
```
set_A={'A', 2, 4, 'D'}
set_B={'A', 'B', 'C', 'D'}
print(set_A & set_B)
```
Output: {'A', 'D'}

- **Difference:** It includes all elements that are in first set but not in the second set. The minus **(-) operator** is used to difference set operation in python.

Example:
```
set_A={'A', 2, 4, 'D'}
set_B={'A', 'B', 'C', 'D'}
print(set_A - set_B)
```
Output: {2, 4}

- **Symmetric difference:** It includes all the elements that are in two sets but not the one that are common to two sets. The caret **(^) operator** is used to symmetric difference set operation in python.

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



CHAPTER 10: Python Classes and objects

Choose the best answer: (1 Mark)

1. Which of the following are the key features of an Object Oriented Programming language?
   (A) Constructor and Classes (B) Constructor and Object
   (C) Classes and Objects (D) Constructor and Destructor
2. Functions defined inside a class:
   (A) Functions (B) Module **(C) Methods** (D) section
3. Class members are accessed through which operator?
   (A) & **(B) .** (C) # (D) %
4. Which of the following method is automatically executed when an object is created?
   (A) __object__( ) (B)__del__( ) (C)__func__( ) **(D)__init__( )**
5. A private class variable is prefixed with
   (A) __ (B) && (C) ## (D) **
6. Which of the following method is used as destructor?
   (A)__init__( ) (B)__dest__( ) (C)__rem__( ) **(D)__del__( )**
7. Which of the following class declaration is correct?
   (A) class class_name (B) class class_name<>
   (C) class class_name: (D) class class_name[ ]
8. Which of the following is the output of the following program?class Student:

```
def__init_(self, name):
self.name=name
print (self.name)
S=Student(Tamil)
```

   (A) Error **(B) Tamil** (C) name (D) self
9. Which of the following is the private class variable?
   (A) __num (B) ##num (C) $$num (D) &&num
10. The process of creating an object is called as:
    (A) Constructor (B) Destructor (C) Initialize **(D) Instantiation**

Answer the following questions: (2 Marks)

1. **What is class?**
   - Class is the main building block in Python.
   - Class is a template for the object.
2. **What is instantiation?**
   - The process of creating object is called as "Class Instantiation".
3. **What is the output of the following program?**

```
class Sample:
    __num=10
    def disp(self):
        print(self.__num)
S=Sample()
S.disp()
print(S.__num)
```

Ootput:

```
>>>10        line 7, in <module>
print(S.__num)
AttributeError: 'Sample' object has no attribute '__num'
>>>
```

4. **How will you create constructor in Python?**
   - **"init"** is a special function begin and end with double underscore in Python act as a Constructor.
   - Constructor function will automatically execute when an object of a class is created.

   General format: def __init__(self, [args ……..]): <statements>
5. **What is the purpose of Destructor?**
   - Destructor is also a special method gets executed automatically when an object exit from the scope.
   - In Python, __del__( ) method is used as destructor.

Answer the following questions: (3 Marks)

1. **What are class members? How do you define it?**
   - Variables defined inside a class are called as "Class Variable" and functions are called as "Methods".
   - Class variable and methods are together known as members of the class.
   - The class members should be accessed through objects or instance of class.
   - A class can be defined anywhere in a Python program.

   Syntax for defining a class:

   class class_name:statement_1 statement_2 … statement_n

2. **Write a class with two private class variables and print the sum using a method.**

Coding:

```
class Sum:
   def __init__(self,n1,n2):
      self.__num1=n1
      self.__num2=n2
   def display(self):
      print(self.__num1+self.__num2)
S=Sum(12,14)
S.display()
```

Output: 26

3. **Find the error in the following program to get the given output?**

```
class Fruits:
        def __init__(self, f1, f2):
                self.f1=f1
                self.f2=f2
        def display(self):
                print("Fruit 1 = %s, Fruit 2 = %s" %(self.f1, self.f2))
F = Fruits ('Apple', 'Mango')
del F.display
F.display()
```

Output: Fruit 1 = Apple, Fruit 2 = Mango

Error: line 8, in <module> del F.display AttributeError: display

4. **What is the output of the following program?**

```
class Greeting:
def __init__(self, name):
        self.__name = name
def display(self):
        print("Good Morning ", self.__name)
obj=Greeting('Bindu Madhavan')
obj.display()
```

Output: Good Morning Bindu Madhavan

5. **How to define constructor and destructor in Python?**

Constructor:

- **"init"**is a special function begin and end with double underscore in Python act as a Constructor.
- Constructor function will automatically executed when an object of a class is created.

General format of constructor: def __init__(self, [args…..]): <statements>

destructor:

- Destructor is also a special method gets executed automatically when an object exit from the scope.
- In Python, __del__( ) method is used as destructor.

General format of destructor: def __del__(self): <statements>

Answer the following questions: (5 Marks)

1. **Explain about constructor and destructor with suitable example.**

Constructor:

- **"init"**is a special function begin and end with double underscore in Python act as a Constructor.
- Constructor function will automatically executed when an object of a class is created.

General format of constructor: def __init__(self, [args…..]): <statements>

destructor:

- Destructor is also a special method gets executed automatically when an object exit from the scope.
- In Python, __del__( ) method is used as destructor.

General format of destructor: def __del__(self): <statements>

Example:

```
class Sample:
    def __init__(self, num):
        print("Constructor of class Sample...")
        self.num=num
        print("The value is :", num)
    def __del__(self):
        print("Destructor of class Sample…")
S=Sample(10)
```

Output:

Constructor of class Sample...
The value is : 10
Destructor of class Sample…

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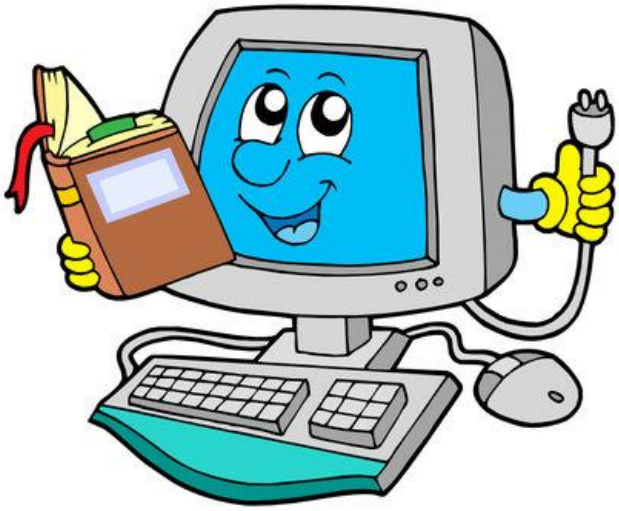
ALL THE BEST!



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