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10. PYTHON CLASSES AND OBJECTS

Section – A

Choose the best answer

(1 Mark)

- 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
- Functions defined inside a class:
 (a) Functions (b) Module (c) Methods (d) section
- Class members are accessed through which operator?
 (a) & (b) . (c) # (d) %
- Which of the following method is automatically executed when an object is created?
 (a) __object__() (b) __del__() (c) __func__() (d) __init__()
- A private class variable is prefixed with
 (a) __ (b) && (c) ## (d) **
- Which of the following method is used as destructor?
 (a) __init__() (b) __dest__() (c) __rem__() (d) __del__()
- Which of the following class declaration is correct?
 (a) class class_name (b) class class_name<> (c) class class_name: (d) class class_name[]
- Which of the following is the output of the following program?
 class Student:
 def __init__(self, name):
 self.name=name
 S=Student("Tamil")
 (a) Error (b) Tamil (c) name (d) self
- Which of the following is the private class variable?
(a) __num (b) ##num (c) \$\$num (d) &&num
- The process of creating an object is called as:
 (a) Constructor (b) Destructor (c) Initialize (d) Instantiation

Section-B

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.
- Object is a collection of data and function that act on those data.
- Objects are also called as instances of a class or class variable.

2. What is instantiation?

- The process of creating object is called as “Class Instantiation”.

Syntax:

Object_name = class_name()

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)
```

OUTPUT:

```
>>>
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 executed 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.

General format:

```
def __del__(self):  
<statements>
```

Section-C

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.

CODE:

```
class Sample:  
    def __init__(self,n1,n2):  
        self.__n1=n1  
        self.__n2=n2  
    def sum(self):  
        print("Class Variable 1:",self.__n1)
```

```
print("Class Variable 2:",self.__n2)
print("Sum:",self.__n1 + self.__n2)
S=Sample(5,10)
S.sum()
```

OUTPUT:

```
>>>
Class Variable 1: 5
Class Variable 2: 10
Sum: 15
>>>
```

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

ERROR CODE:

```
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
```

CORRECT CODE:

```
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')
F.display()
```

OUTPUT:

Fruit 1 = Apple, Fruit 2 = Mango

4. What is the output of the following program?

CODE:

```
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 do 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>
```

Section - D

Answer the following questions:

(5 Marks)

1. Write a menu driven program to add or delete stationary items. You should use dictionary to store items and the brand.

CODE:

```
stationary={ }  
print("\n1. Add Item \n2.Delete item \n3.Exit")  
ch=int(input("\nEnter your choice: "))  
while(ch==1)or(ch==2):  
    if(ch==1):  
        n=int(input("\nEnter the Number of Items to be added in the Dictionary: "))  
        for i in range(n):  
            item=input("\nEnter an Item Name: ")  
            brand=input("\nEnter the Brand Name: ")  
            stationary[item]=brand  
        print(stationary)
```

```
elif(ch==2):  
    ritem=input("\nEnter the item to be removed from the Dictionary: ")  
    stationary.pop(ritem)  
    print(stationary)  
ch=int(input("\nEnter your choice: "))
```

OUTPUT:

```
>>>  
===== RESTART: C:/Users/SANJANASRI.SANJANASRI-PC/Desktop/Python/menu.py =====  
  
1. Add Item  
2.Delete item  
3.Exit  
  
Enter your choice: 1  
  
Enter the Number of Items to be added in the Dictionary: 2  
  
Enter an Item Name: Pen  
  
Enter the Brand Name: Rorito  
  
Enter an Item Name: Pencil  
  
Enter the Brand Name: Camlin  
{'Pen': 'Rorito', 'Pencil': 'Camlin'}  
  
Enter your choice: 2  
  
Enter the item to be removed from the Dictionary: Pen  
{'Pencil': 'Camlin'}  
  
Enter your choice: 3  
>>> |
```

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