COURSE CODE (CREDITS): 18B11CI314 (3)   MAX. MARKS: 25

COURSE NAME: PYTHON PROGRAMMING ESSENTIALS

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Note: All questions are compulsory. Marks are indicated against each question in square brackets.

Ques 1. Find the output of following python code:

[5 marks]
[CO 1,5]

(a)
```python
class A:
    def __init__(self,x=3):
        self.x = x
class B(A):
    def __init__(self):
        super().__init__(5)
    def display(self):
        print(self._x)
def main():
    obj = B()
    obj.display()

main()
```

(b)
```python
class A:
    def __init__(self,x):
        self.x = x
    def count(self,x):
        self.x = self.x+1
class B(A):
    def __init__(self, y=0):
        A.__init__(self, 3)
        self.y = y
    def count(self):
        self.y += 1
def main():
    obj = B()
    obj.count()
    print(obj.x, obj.y)
main()
```

(c)
```python
def add(c,k):
    c.test=c.test+1
    k=k+1
class A:
    def __init__(self):
        self.test = 0
def main():
    count=A()
    k=0

    for i in range(0,25):
        add(count,k)
    print("count.test=", count.test)
    print("k =", k)
main()
```

(d)
```python
valid = False
while not valid:
    try:
        n=int(input("Enter a number"))
        while n%2==0:
            print("Bye")
            valid = True
    except ValueError:
        print("Invalid")
```

(e)

```
def func (var1, var2, var3):
    if(var1<=var2):
        if(var3>=var2):
            if(var1+var2>=var3):
                print(-1)
            else:
                print(-2)
        else:
            if(var1+var3>var2):
                print (-3)
            else:
                print (-4)
func(156,2100,9500)
```

Ques 2. (a) Write a Python script to save and retrieve a dictionary into a file where the keys are numbers between 1 and 15 (both included) and the values are square of keys. **[3, 2 marks] [CO 4]**
Sample Dictionary {1: 1, 2: 4, 3: 9, 4: 16, 5: 25, 6: 36, 7: 49, 8: 64, 9: 81, 10: 100, 11: 121, 12: 144, 13: 169, 14: 196, 15: 225}
(b) What are exceptions handling in python? Explain any four built-in exceptions of python with suitable scripting codes.

Ques 3. Tower of Hanoi is a mathematical puzzle where we have three rods and n disks. The objective of the puzzle is to move the entire stack to another rod, obeying the following simple rules: **[5 marks] [CO 2]**
1) Only one disk can be moved at a time.
2) Each move consists of taking the upper disk from one of the stacks and placing it on top of another stack i.e. a disk can only be moved if it is the uppermost disk on a stack.
3) No disk may be placed on top of a smaller disk.
Note: Transferring the top n-1 disks from source rod to Auxiliary rod can again be thought of as a fresh problem and can be solved in the same manner.
Write a python code for the problem mentioned above and dry run the code by taking suitable example?

Ques 4. (a) Explain the concept of operator overloading in python. Explain and sample code four operators corresponding to overloading in python. **[2, 3 marks] [CO 4]**
(b) Write a program that overloads the <= operator so that it can do comparison on objects of a class.

Ques 5. (a) Consider a line "From jagpreet.sidhu\@juit.ac.in Sat Oct 23 09:14:16 2021" in the file email.txt. Write a Python code to read the file and extract email address from the lines starting from the word "From". **[3,2 marks] [CO 4,5]**
(b) Write a short note on Python Errors and Built-in Exceptions? Write a code to demonstrate the concept user-defined Exception and Raise?