I. Multiple Choice

Write the corresponding letter of your choice in the following Python concepts. [40 marks]

1. Is Python case sensitive when dealing with identifiers?
a) yes
b) no
c) machine dependent
d) none of the mentioned

2. What is the maximum possible length of an identifier?
a) 31 characters
b) 63 characters
c) 79 characters
d) none of the mentioned

3. Which is the correct operator for power(x^y)?
a) x^y
b) x**y
c) x^^y
d) None of the mentioned

4. What is the order of precedence in python?
i) Parentheses
ii) Exponential
iii) Division
iv) Multiplication
v) Addition
vi) Subtraction

a) i,ii,iii,iv,v,vi
b) ii,i,iii,iv,v,vi
c) ii,i,iv,iii,v,vi
d) i,ii,iii,iv,vi,v

5. The expression int(x) implies that the variable x is converted to integer. State whether true or false.
a) True
b) False

6. Which of these in not a core datatype?
a) Lists
b) Dictionary
c) Tuples
d) Class

7. Following set of commands are executed in shell, what will be the output?
```
str="hello"
str[:2]
```

a) he
b) lo
c) olleh
d) hello

8. In python we do not specify types,it is directly interpreted by the compiler, so consider the following operation to be performed.
x = 13 ? 2

The objective is to make sure x has an integer value, select all that apply (python 3.xx)

a) x = 13 // 2
b) x = int(13 / 2)
c) x = 13 % 2
d) All of the mentioned

9. Carefully observe the code and give the answer.

```
def example(a):
    a = a + '2'
    a = a*2
    return a

example("hello")
```

a) indentation Error
b) cannot perform mathematical operation on strings
c) hello2
d) hello2hello2

10. What datatype is the object below?
L = [1, 23, 'hello', 1].
a) list
b) dictionary
c) array
d) tuple

11. In order to store values in terms of key and value we use what core datatype.
a) list
b) tuple
c) class
d) dictionary

12. The value of the expressions 4/(3*(2-1)) and 4/3*(2-1) is the same. State whether true or false.
a) True
b) False

13. What is the output of the following function?

```
def f(p, q):
        return p%q
f(0, 2)
f(2, 0)
```

a) 0
0
b) Zero Division Error
Zero Division Error
c) 0
Zero Division Error
d) Zero Division Error
0

14. What is the output of the following?

```
x = ['ab', 'cd']
for i in x:
   i.upper()
print(x)
```

a) [‘ab’, ‘cd’].
b) [‘AB’, ‘CD’].
c) [None, None].
d) none of the mentioned

15. What is the output of the following?

```
x = ['ab', 'cd']
for i in x:
   x.append(i.upper())
print(x)
```

a) [‘AB’, ‘CD’].
b) [‘ab’, ‘cd’, ‘AB’, ‘CD’].
c) [‘ab’, ‘cd’].
d) none of the mentioned

16. What is the output of the following?

```
True = False
while True:
   print(True)
   break
```

a) True
b) False
c) None
d) none of the mentioned

17. What is the output of the following?

```
x = "abcdef"
i = "a"
while i in x:
    x = x[1:]
    print(i, end = " ")
```

a) a a a a a a
b) a
c) no output
d) error

18. What is the output of the following?

```
for i in '':
    print (i)
```

a) None
b) (nothing is printed)
c) error
d) none of the mentioned

19. What arithmetic operators cannot be used with strings?
a) +
b) *
c) –
d) All of the mentioned

20. What is the output of the following code?

```
class father:
    def __init__(self, param):
        self.o1 = param

class child(father):
    def __init__(self, param):
        self.o2 = param

obj = child(22)
print ("%d %d" % (obj.o1, obj.o2))
```

a) None None
b) None 22
c) 22 None
d) Error is generated

21. What is the output of the following code?

```
class tester:
    def __init__(self, id):
        self.id = str(id)
        id="224"

temp = tester(12)
print(temp.id)
```

a) 224
b) Error
c) 12
d) None

22. What is the output of the following code?

```
class Count:
    def __init__(self, count = 0):
            self.__count = count

c1 = Count(2)
c2 = Count(2)
print(id(c1) == id(c2), end = " ")

s1 = "Good"
s2 = "Good"
print(id(s1) == id(s2))
```

a) True False
b) True True
c) False True
d) False False

23. What is the output of the following code?

```
class Name:
    def __init__(self, firstName, mi, lastName):
        self.firstName = firstName
        self.mi = mi
        self.lastName = lastName

firstName = "John"
name = Name(firstName, 'F', "Smith")
firstName = "Peter"
name.lastName = "Pan"
print(name.firstName, name.lastName)
```

a) Peter Pan
b) John Pan
c) Peter Smith
d) John Smith

24. What function do you use to read a string?
a) input("Enter a string")*
b) eval(input("Enter a string"))
c) enter("Enter a string")
d) eval(enter("Enter a string"))

25. What is the output when following code is executed?

```
myList = [1, 5, 5, 5, 5, 1]
max = myList[0]
indexOfMax = 0
for i in range(1, len(myList)):
    if myList[i] > max:
        max = myList[i]
        indexOfMax = i

print(indexOfMax)
```

a) 1
b) 2
c) 3
d) 4

26. What will be the output?

```
def f(i, values = []):
    values.append(i)
    return values

f(1)
f(2)
v = f(3)
print(v)
```

a) [1] [2] [3].
b) [1] [1, 2] [1, 2, 3].
c) [1, 2, 3].
d) 1 2 3

27. What will be the output?

```
values = [[3, 4, 5, 1], [33, 6, 1, 2]]

v = values[0][0]
for row in range(0, len(values)):
    for column in range(0, len(values[row])):
        if v < values[row][column]:
            v = values[row][column]
print(v)
```

a) 3
b) 5
c) 6
d) 33

28. What will be the output?

```
numberGames = {}
numberGames[(1,2,4)] = 8
numberGames[(4,2,1)] = 10
numberGames[(1,2)] = 12
sum = 0
for k in numberGames:
   sum += numberGames[k]
print len(numberGames) + sum
```

a) 30
b) 24
c) 33
d) 12

29. _____ represents an entity in the real world with its identity and behaviour.
a) A method
b) An object
c) A class
d) An operator

30. What is the output of the following code?

```
class change:
   def __init__(self, x, y, z):
      self.a = x + y + z

x = change(1,2,3)
y = getattr(x, 'a')
setattr(x, 'a', y+1)
print(x.a)
```

a) 6
b) 7
c) Error
d) 0

31. What is Instantiation in terms of OOP terminology?
a) Deleting an instance of class
b) Modifying an instance of class
c) Copying an instance of class
d) Creating an instance of class

32. Which of the following best describes inheritance?

a) Ability of a class to derive members of another class as a part of its own definition
b) Means of bundling instance variables and methods in order to restrict access to certain class members
c) Focuses on variables and passing of variables to functions
d) Allows for implementation of elegant software that is well designed and easily modified

33. What is the output of the following piece of code?

```
class A():
    def disp(self):
        print("A disp()")
class B(A):
    pass
obj = B()
obj.disp()
```

a) Invalid syntax for inheritance
b) Error because when object is created, argument must be passed
c) Nothing is printed
d) A disp()

34. Suppose B is a subclass of A, to invoke the __init__ method in A from B, what is the line of code you should write?

a) A.__init__(self)
b) B.__init__(self)
c) A.__init__(B)
d) B.__init__(A)

35. What is the output of the following piece of code?

```
class Test:
    def __init__(self):
        self.x = 0
class Derived_Test(Test):
    def __init__(self):
        Test.__init__(self)
        self.y = 1
def main():
    b = Derived_Test()
    print(b.x,b.y)
main()
```

a) Error because class B inherits A but variable x isn't inherited
b) 0 0
c) 0 1
d) Error, the syntax of the invoking method is wrong

36. What is the output of the following piece of code?

```
class A:
    def __init__(self, x= 1):
        self.x = x
class der(A):
    def __init__(self,y = 2):
        super().__init__()
        self.y = y
def main():
    obj = der()
    print(obj.x, obj.y)
main()
```

a) Error, the syntax of the invoking method is wrong
b) The program runs fine but nothing is printed
c) 1 0
d) 1 2

37. What type of inheritance is illustrated in the following piece of code?

```
class A():
    pass
class B():
    pass
class C(A,B):
    pass
```

a) Multi-level inheritance
b) Multiple inheritance
c) Hierarchical inheritance
d) Single-level inheritance

38. The following code is executed

```
def f(x):
        return x + 2, x * 2

x, y = f(5)
print(x + y)
```

What is the output produced by the print() statement?

a) 7 10
b) 17
c) x + y
d) This produces an error.

39. Names that are valid for variables are also valid for functions.

a) True
b) False

40. Bonus

II. Analysis and Programming

1. Inheritance [10 marks]

Consider the following code:

```
class Spell:
        def __init__(self, incantation, name):
                self.name = name
                self.incantation = incantation
        def __str__(self):
                return self.name + ' ' + self.incantation + '\n' + self.get_description()
        def get_description(self):
                return 'No description'
        def execute(self):
                print self.incantation

class Accio(Spell):
        def __init__(self):
                Spell.__init__(self, 'Accio', 'Summoning Charm')
                        class Confundo(Spell):
        def __init__(self):
                Spell.__init__(self, 'Confundo', 'Confundus Charm')
        def get_description(self):
                return 'Causes the victim to become confused and befuddled.'
        def study_spell(spell):
                print(spell)

spell = Accio()
spell.execute()
study_spell(spell)
study_spell(Confundo())
```

a. What are the parent and child classes here?

b. What does the code print out? (Try figuring it out without running it in Python)

c. Which get description method is called when 'study spell(Confundo())' is executed? Why?

d. What do we need to do so that 'print Accio()' will print the appropriate description ('This charm summons an object to the caster, potentially over a significant distance')?

Write down the code that we need to add and/or change.

2. You are required to create an application to manage staff salary data (use classes). [50 marks]

Requirements for the prototype program are as follows:

a. Program will **read file data.txt**

Format:
ID#Name#Position#SalaryAmount

b. Program will **display records(sorted by name)** of data.txt to the screen.

```
|ID      |Name           |Position       |Salary    |
|S0001   |Garry          |Staff          |   4500000|
|S0002   |James          |Staff          |   5000000|
|S0004   |Judith         |Manager        |  10700000|
|S0003   |Yuli           |Officer        |   8500000|


1. New Staff
2. Delete Staff
3. View Summary Data
4. Save & Exit
Input Choice:
```

c. The program will display a menu which contains the following:
   1. New Staff
   2. Delete Staff
   3. View Summary Data
   4. Save and Exit

d. If user choose menu 1 "**New Staff**".
   a. Ask user to input Staff ID, with the following requirements:
      i. The length must be 5 characters.
      ii. The first character must be 'S'.
      iii. The second until fifth character must be numeric.
      iv. Staff ID must be unique

   b. Ask user to input name with **length** of **name should not be more than 20 characters**.
   c. Ask user to input position which must be '**Staff**' or '**Officer**' or '**Manager**'
   d. Ask user to input salary, with following requirements:

Position	**Salary Range**
Staff	3,500,000 – 7,000,000
Officer	7,000,001 – 10,000,000
Manager	> 10,000,000

```
1. New Staff
2. Delete Staff
3. View Summary Data
4. Save & Exit
Input Choice:1
New Staff
Input ID[SXXXX]:SS123
Input ID[SXXXX]:S0007
Input Name[0...20]:Caleb
Input Position[Staff|Officer|Manager]:Director
Input Position[Staff|Officer|Manager]:Officer
Input Salary for Officer:9000000
```

e. User can choose menu "**Delete Staff**".
   a. Ask user to input staff id.
   b. Validate the staff whether in the list or not.
   c. If the ID exists, then delete the record from the list.

```
|ID      |Name          |Position      |Salary    |
|S0001   |Garry         |Staff         |   4500000|
|S0002   |James         |Staff         |   5000000|
|S0004   |Judith        |Manager       |  10700000|
|S0003   |Yuli          |Officer       |   8500000|


1. New Staff
2. Delete Staff
3. View Summary Data
4. Save & Exit
Input Choice:2
Delete Staff
Input ID[SXXXX]:S0009
Data Not Found
```

```
|ID      |Name          |Position      |Salary    |
|S0001   |Garry         |Staff         |   4500000|
|S0002   |James         |Staff         |   5000000|
|S0004   |Judith        |Manager       |  10700000|
|S0003   |Yuli          |Officer       |   8500000|


1. New Staff
2. Delete Staff
3. View Summary Data
4. Save & Exit
Input Choice:2
Delete Staff
Input ID[SXXXX]:S0004
Data has been successfully deleted
```

f. If user choose menu 3 "View Summary Data", the program will show the minimum, maximum, and average salary for each position.

```
1. Staff
Minimum Salary: 4500000
Maximum Salary: 5000000
Average Salary: 4750000

2. Officer
Minimum Salary: 8500000
Maximum Salary: 8500000
Average Salary: 8500000

3. Manager
Minimum Salary: 10700000
Maximum Salary: 10700000
Average Salary: 10700000
```

g. If user choose menu 4 "Save & Exit", the program will write staff salary data into data.txt and the application will be closed.

Format: **ID#Name#Position#SalaryAmount**

Save and Send github repository link to edujzenitram@gmail.com @11.30am today

{End of Quiz}