| Name:

Enrolment No: |  |
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**UPES**
**End Semester Examination, December 2023**

| Course: Python Programming | Semester: 1 |
|---|---|
| Program:    MCA | Time      : 03 hrs. |
| Course Code: CSAI7011 | Max. Marks: 100 |

**Instructions: Attempt all questions**

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**SECTION A**
**(5Qx4M=20Marks)**

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| S. No. | | Marks | CO |
|---|---|---|---|
| Q1 | Consider the following code and explain the functionality of "end" in second and fourth print statements.<br><br>Subject="Python"<br><br>print("UPES", end=" ")<br><br>print(Subject)<br><br>print("UPES", end="\n")<br><br>print(Subject) | **4** | **CO2** |
| Q2 | Given a dictionary dict1 = {1: "Python", 2: "Java", 3: "Ruby", 4:"Scala"}. Write down single line codes for following scenarios:<br>    i)  Add a new pair (5 : C++) to the dictionary.<br>    ii) Removes the last inserted key-value pair | **4** | **CO1** |
| Q3 | Consider a List, Test_List= [0,2,4,6,8,10. Explain the difference between the functionality of insert(), append() and extend() functions in Test_List. | **4** | **CO2** |
| Q4 | Differentiate Public, Private and Protected access. Explain which type of access attribute is declared here.<br><br>  class Medicine:<br>   def init (self, salt, expiry):<br>     self. salt = salt<br>     self. expiry = expiry | **4** | **CO5** |
| Q5 | Explain the following codes<br><br>Determine and explain its output.<br>        i)   "{0:b}".format(45)<br>        ii)  "{0:.2f}".format(345.7916732) | **4** | **CO1** |

| | **SECTION B**<br>**(4Qx10M= 40 Marks)** | | |
|---|---|---|---|
| Q6 | Define Pandas in python? Write a Pandas program to compare the elements of the two Pandas Series. | **10** | **CO3** |
| Q7 | Discuss numpy array search. How searchsorted() works. What is broadcasting in matrix addition. | **10** | **CO3** |
| Q8 | Explain the role of the "try", "except", and "finally" blocks in Python? Determine the output of following code:<br><br>`def function(a, b):`<br><br>    `try:`<br><br>      `print(a/b)`<br><br>    `except TypeError:`<br><br>      `print("Unsupported operation")`<br><br>    `except ZeroDivisionError:`<br><br>      `print("Division by zero not allowed")`<br><br>`function(1, 0)` | **10** | **CO2** |
| Q9 | Define packages with the help of an example? Give an example of package creation in Python. Discuss the relation between tuples and lists, tuples and dictionaries in detail.<br>**OR**<br>Describe Arithmetic Operators, Assignment Operators, Comparison Operators, Logical Operators and Bitwise Operators in detail with examples.<br>Construct the program for:<br>Given an integer $n$, perform the following conditional actions:<br><br>• If $n$ is odd, print Weird<br>• If $n$ is even and in the inclusive range of 2 to 5 , print Not Weird<br>• If $n$ is even and in the inclusive range of 6 to 20, print Weird<br>• If $n$ is even and greater than 20, print Not Weird<br><br>Test cases-<br>4- Not Weird<br>18- Weird<br>29- Weird<br>5- Weird | **10** | **CO1** |
| | **SECTION-C**<br>**(2Qx20M=40 Marks)** | | |

| Q10 | Define Numpy and Why NumPy is used in Python? Discuss different ways for Numpy-Array Creation from functions with examples. Explain Numpy-Matrix Library with examples.<br>**Or**<br>Refer the given excel file and perform various operations using pandas library:<br><br>| 0 | GOOGL | 27.82 | 87 | 845 | larry page |<br>| 1 | WMT | 4.61 | 484 | 65 | n.a. |<br>| 2 | MSFT | -1 | 85 | 64 | bill gates |<br>| 3 | RIL | not available | 50 | 1023 | mukesh ambani |<br>| 4 | TATA | 5.6 | -1 | n.a. | ratan tata |<br><br>a.  Read the above excel file in python.<br>b.  How do I write this file to a new file "new.csv"?<br>c.  Include column names in this file. Use 'ticker', 'eps', 'revenue', 'price', 'people' as column names.<br>d.  Convert all not available or n.a. values to NAN and also convert negative revenues to NAN because revenues can never be negative.<br>e.  Fill NAN values using a suitable approach.<br>f.  Write a function to change n.a value appearing in WMT to Sam Walton | 20 | CO5 |
|---|---|---|---|
| Q11 | Explain polymorphism with example.<br>Create a Vehicle class with max_speed and mileage as instance attributes. Additionally, create a method named seating_capacity() using the below syntax:<br><br>```<br>def seating_capacity(self, capacity):<br>    return f"The seating capacity of a {self.name} is {capacity} passengers"<br>```<br><br>a) Create child class 'Bus' that will inherit all of the variables and methods of the Vehicle class. Set the seating capacity of the bus to 50 using super().<br>b) Create a Bus object that will inherit all of the variables and methods of the Vehicle class and display it.<br>c) Define a class attribute "color" with a default value white. I.e., Every Vehicle should be white. | 20 | CO4 |