ગૂજરાત વિદ્યાપીઠ : અમદાવાદ

વ્યવસ્થાપન અને પ્રૌદ્યોગિકી વિજ્ઞાન વિદ્યાશાખા

કમ્પ્યૂટર વિજ્ઞાન વિભાગ

પરીક્ષાર્થી ક્રમાંક

માસ્ટર ઓફ કમ્પ્યૂટર એપ્લીકેશન (M.C.A.) : સત્ર-1 (રીપીટર)

સત્રાંત પરીક્ષા : ઑક્ટોબર-2023

MCA–103 : Mathematical and Statistical Computing With Python

તા. 01/11/2023 સમય : 12-00 થી 02-30

વાર : બુધવાર કુલગુણ : 60

Que-1 (A) Answer the following questions (Answer any five) **05**

1. Is Python code compiled or interpreted?
   a) Python code is both compiled and interpreted
   b) Python code is neither compiled nor interpreted
   c) Python code is only compiled
   d) Python code is only interpreted
2. All keywords in Python are in _____
   a) Capitalized b) lower case
   c) UPPER CASE d) None of the mentioned
3. What will be the output of the following Python code?

```
i = 1
while True:
    if i%3 == 0:
    break
    print(i)
        i += 1
```

   a) 1 2 3 b) error c) 1 2 d) none of the mentioned
4. Statistics is divided into two main areas, which are ____ and ____.
   a) Non-Descriptive and Inferential b) Descriptive and Inferential
   c) Polynomial and Descriptive d) Polynomial and Inferential
5. Give an example of Nominal-level measurement.
   a) Gender b) Temperature c) Eye color d) a and c
6. Which is not the type of variable in statistics?
   a) Nominal b) Ordinal
   c) Ratio d) Complex
7. If |A|=0 than only A-1 is possible. True / False
8. The probability of an event always lies between _____.
   a. 0 and 1
   b. <0 and >1

(B) Answer the following questions in 3 to 4 sentences: (Answer any two) **04**

1. What is the Normal Distribution?
2. What is the difference between conditional and marginal probability?
3. Explain Lambda Function with an example.
4. What are the types of datasets? Explain with examples.

(C) Explain in detail. (Answer any one) **06**

1. Explain Measures of Central Tendency and Measures of Dispersion in detail.
2. Explain Data Structures in Python with proper examples.

Que-2 (A) Answer the following questions (Answer any five) **05**

1. Which of the following functions can help us to find the version of python that we are currently working on?
   a) sys.version(1) b) sys.version(0)
   c) sys.version() d) sys.version
2. Which of the following things can be data in Pandas?
   a) a python dict b) an ndarray
   c) a scalar value d) all of the mentioned
3. Pip stands for ____.
   a) Preferred Installer Program b) Performance Improvement Plan
   c) Percentage In Points d) None of the above
4. Which of the following is the use of id() function in python?
   a) Every object doesn't have a unique id
   b) Id returns the identity of the object
   c) All of the mentioned
   d) None of the mentioned
5. What is eigen value?
6. What will be the output of the following code snippet?

```
t = [1, 2, 3]
t = tuple(t)
t[0] = 2
print(t)
```

   a) [2,2,3] b) (2,2,3)
   c) (1,2,3) d) Error
7. To create histogram matplotlib provides _____ function.
   a) hist() b) histo() c) histogram() d) histg()
8. Can we add elements in Tuple?
   a) Yes 2) No

(B) Answer the following questions in 3 to 4 sentences: (Answer any two) **04**

1. What is Vector Space in Linear Algebra?
2. What are first order and second order derivatives?
3. Calculate determinant for
   |8 6|
   |3 4|.
4. What is Partial derivatives?

(C) Explain in detail. (Answer any one) **06**

1. Explain Eigenvalues and Eigenvectors with an example.
2. A= |1 2 1|
   |3 1 1|
   |1 3 2|
   Find the value of |A|.

Que-3 (A) Answer the following questions (Answer any five) **05**

1. Which of the following is not a core data type in Python programming?
   a) Tuples b) Lists
   c) Class d) Dictionary
2. What will be the output of the following Python expression if x=56.236?

```
print("%.2f"%x)
```

   a) 56.236 b) 56.23
   c) 56.0000 d) 56.24
3. How to open a file in python?
   a) fpopen() b) fopen()
   c) fsopen() d) open()
4. Lists are immutable objects. True/False

5. Dictionaries are unordered. True/False
6. Which keywords are used to handle the exceptions in python?
   a) try and catch b) try and except
   c) exception and catch d) try and exception
7. What is the root class to handle any exception?
8. What is the maximum possible length of an identifier in Python?
   a) 79 characters b) 31 characters
   c) 63 characters d) none of the mentioned

(B) Answer the following questions in 3 to 4 sentences: (Answer any two) **04**

1. Write a program to generate random numbers between 0 and 9.
2. Difference between List and Tuple.
3. Explain membership operators in python.
4. Write a program to reverse a string.

(C) Explain in detail: (Answer any one) **06**

1. Differentiate *break*, *continue* and *pass* keywords with proper examples.
2. What is the use of Decorators? What are the applications of Decorators? Explain with an example.

Que-4 (A) Answer the following questions (Answer any five) **05**

1. Is Matplotlib open-source and free? a) Yes b) No
2. Matplotlib is a ____ library for the Python programming language.
   a) data science b) mathematics c) numpy d) plotting
3. A series object is size mutable. a) True b) False
4. A Dataframe object is value mutable. a) True b) False
5. Amongst which of the following is used to analyze the data in pandas?
   a) Dataframe b) Series c) Both A and B d) None of the above
6. What is the purpose of NumPy in Python?
   a) To do numerical calculations b) To do scientific computing
   c) Both A and B d) None of the mentioned above
7. Amongst which of the following is true with reference to Pip in Python?
   a) Pip is a standard package management system
   b) It is used to install and manage the software packages written in Python
   c) Pip can be used to search a Python package
   d) All of the mentioned above
8. NumPy arrays can be ___.
   a) Indexed b) Sliced
   c) Iterated d) All of the mentioned above

(B) Answer the following questions in 3 to 4 sentences: (Answer any two) **04**

1. Give any five names of built-in functions with its usage.
2. What is the difference between built-in function and user-defined function? Explain with an example.
3. What is slicing in python? Explain with an example.
4. What is the difference between module and package?

(C) Explain in detail: (Answer any one) **06**

1. What is Pandas Dataframe? How to create, select and delete the element from a dataframe? Explain with an example.
2. Why is Data Cleaning essential? And how to handle missing values? Explain.

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