GOVERNMENT DEGREE COLLEGE, NANDIKOTKUR

DEPARTMENT OF COMPUTER APPLICATIONS

DATA SCIENCE USING PYTHON

Unit 1: Introduction to Data Science

Multiple Choice Questions (MCQs)

1. Which of the following best describes the role of a data scientist? a) Manage databases
   b) Analyze and interpret complex data
   c) Design network infrastructure
   d) Develop web applications
   Answer: b)

2. Python is widely used in data science because: a) It is difficult to learn
   b) It is an older programming language
   c) It has a vast collection of libraries for data science
   d) It has limited community support
   Answer: c)

3. Which of the following is not a responsibility of a data scientist? a) Data analysis
   b) Model building
   c) Data cleaning
   d) Hardware maintenance
   Answer: d)

Fill in the Blanks

1. _____ is a critical skill for a data scientist to have in order to interpret and communicate data findings effectively.
   Answer: Analytical ability

2. Python is popular in data science due to its readability and extensive _____ for data manipulation and analysis.
   Answer: libraries

3. A data scientist should have strong skills in _____ and _____ to perform data analysis and build models.
   Answer: statistics, programming

Short Answer Questions

1. What are the main responsibilities of a data scientist?
2. Why is Python preferred for data science over other programming languages?
3. What qualifications are important for a data scientist?

Long Answer Questions

1. Describe the importance of data science in modern industries and how it contributes to decision-making.
2. Explain the steps involved in the data science process, from data collection to model evaluation.
3. Discuss the advantages of using Python for data science, including its libraries and ease of use.

Unit 2: Introduction to Python

Multiple Choice Questions (MCQs)

1. The if-else conditional statement in Python is used for: a) Creating loops
   b) Decision making
   c) Defining variables
   d) Importing libraries
   Answer: b)
2. Which of the following is not a Python data type? a) integer
   b) string
   c) array
   d) dictionary
   Answer: c)
3. Which operator is used for exponentiation in Python? a) +
   b) ^
   c) **
   d) %
   Answer: c)

Fill in the Blanks

1. In Python, indentation is used to define the _____ of code blocks.
   Answer: structure

2. The _____ statement is used to skip an iteration in a loop without ending the loop.
   Answer: continue
3. Python's while loop executes as long as the specified _____ is true.
   Answer: condition

Short Answer Questions

1. What are variables in Python, and how are they declared?
2. List the different types of operators in Python and give an example for each.
3. Explain the purpose of the break and continue statements in Python loops.

Long Answer Questions

1. Describe the features of Python and explain why it is widely used in programming.
2. Explain conditional statements in Python with examples of if, if-else, and nested if-else statements.
3. Discuss looping structures in Python, with examples of for and while loops, and explain the role of the break, continue, and pass statements.

Unit 3: Control Structures and Strings

Multiple Choice Questions (MCQs)

1. Which Python data structure is mutable and can contain elements of different data types? a) Tuple
   b) List
   c) Dictionary
   d) String
   Answer: b)
2. In Python, a string slice can be accessed using: a) Brackets []
   b) Curly braces {}
   c) Parentheses ()
   d) Colons ::
   Answer: a)
3. Which function is used to get the length of a list in Python?

a) length()
b) size()
c) len()
d) count()
Answer: c)

Fill in the Blanks

1. In Python, lists are _____, meaning their elements can be modified.
   Answer: mutable
2. A _____ is a sequence of characters enclosed within single or double quotes in Python.
   Answer: string
3. Dictionaries in Python store data in _____ pairs.
   Answer: key-value

Short Answer Questions

1. What are the differences between lists and tuples in Python?
2. How can you access and modify elements in a dictionary?
3. Explain string slicing with an example.

Long Answer Questions

1. Describe the operations that can be performed on lists in Python, with examples.
2. Discuss the structure and usage of dictionaries in Python, including methods to access, update, and delete entries.
3. Explain how strings are used and manipulated in Python, including slicing, concatenation, and basic string operations.

Unit 4: Functions and Modules

Multiple Choice Questions (MCQs)

1. A function in Python is defined using which keyword? a) func
   b) function
   c) def
   d) lambda
   Answer: c)

2. Which of the following is a built-in Python module used for mathematical operations? a) random
   b) math
   c) array
   d) os
   Answer: b)
3. The lambda function in Python is: a) A function without a name
   b) Used to define classes
   c) Used for loops only
   d) A reserved keyword for error handling
   Answer: a)

Fill in the Blanks

1. Functions that do not have a return statement in Python return _____ by default.
   Answer: None
2. The math module in Python provides functions for performing _____ operations.
   Answer: mathematical
3. A function can accept input values known as _____ when it is called.
   Answer: arguments

Short Answer Questions

1. What are the differences between local and global variables in Python?
2. How does a lambda function work in Python? Provide an example.
3. Describe the purpose of the random module and give an example of its use.

Long Answer Questions

1. Explain the process of defining and calling functions in Python, including examples of different types of functions.
2. Discuss the purpose of function arguments in Python, and explain with examples the difference between positional and keyword arguments.
3. Describe the use of the math and random modules in Python, including examples of commonly used functions in each.

Unit 5: Classes & Objects

Multiple Choice Questions (MCQs)

1. In Python, the self keyword is used in methods to: a) Refer to the class itself
   b) Refer to the instance of the class
   c) Access the parent class
   d) Define a class variable
   Answer: b)

2. Which of the following denotes a private attribute in Python? a) __attribute
   b) attribute_
   c) _attribute
   d) attribute__
   Answer: a)

3. A static method in Python: a) Can access only class variables
   b) Can access only instance variables
   c) Does not require self or cls parameters
   d) Is automatically called upon object creation
   Answer: c)

Fill in the Blanks

1. In Python, a class is defined using the _____ keyword.
   Answer: class

2. The _____ method in a Python class is called a constructor, and it initializes the instance variables.
   Answer: init

3. Private methods in a class are denoted by _____ before the method name.
   Answer: double underscore (__)

Short Answer Questions

1. What is the purpose of the self argument in class methods?
2. How are class variables different from instance variables in Python?
3. Explain the use of private methods in Python classes.

Long Answer Questions

1. Describe how to create a class in Python, including defining methods and attributes, with an example.
2. Explain the difference between class variables and instance variables, and provide examples of when each should be used.
3. Discuss the use of static methods in Python, including how to define and use them within a class.