

Bachelor of Science (BSc (DS/Cyber))
Re-appear, Examination
Dec, 2024



ENSP107- Introduction to Computer Science and programming in Python

Time: 2.5 Hours

Maximum Marks: 50

Instructions:

- 1) Question No. 1 under Section-A is compulsory.
- 2) Attempt any four from Q. No. 2 to Q. No. 6 under Section-B
- 3) Attempt any two from Q. No. 7 to Q. No.9 under Section-C

Section-A (Compulsory)

1. (a) Fill in the blanks with appropriate words: 3
[CO3-] [L-ii]
 - (i) In Python, lists are _____, allowing elements to be added, removed, or modified after the list's creation, while tuples are _____, meaning their elements cannot be changed once the tuple is created.
 - (ii) _____ is the process of breaking down a complex problem into smaller, more manageable parts, while _____ is the principle of hiding unnecessary details of a function or process, focusing only on the essential elements.
 - (iii) _____ is a programming technique where a function calls itself directly or indirectly to solve a problem, often used in scenarios where a problem can be broken down into smaller, similar subproblems. _____ are a data structure in Python that store data in the form of key-value pairs, providing efficient access to values based on their corresponding keys.

1. (b) Give the term used for the following: 2
[CO-] [L-iii]
 - (i) Which type of value is to be returned by input function.
 - (ii) Term used to describe the process of accessing specific elements or sections of a list or tuple based on their position or range of positions within the sequence?

1. (c) State one function of each of the following: 2 [CO-] [L-ii]
 - (i) Concat()
 - (ii) Uppercase()

1. (d) Match the items given in Column-A with those in Column-B: 3 [CO-] [L-i]

Column-A	Column-B
(i) Mutable	(a) List
(ii) Immutable	(b) Tuple
(iii) Mutable	(c) Dictionary

Section-B

2. a) Program to check if input number is a prime number 5[CO-2] [L-Vii]
b) Program to print multiplication table of a given number
3. Write a program that converts temperature from Celsius to Fahrenheit and vice versa. 5[CO-3] [L-vii]
4. Write a program to find out factorial of given term using recursion. 5[CO-2] [L-vii]
5. Write a program for searching a specific element in the sorted list and return its index if found; otherwise, return -1. 5[CO-3] [L-vii]
6. (a) Make pattern using Python
1
23
456
78910

b) 3
3 5
3 5 7
3 5 7 9
3 5 7 9 11 5[CO-4] [L-vii]

Section-C

7. Explain the concept of algorithm analysis and its significance in evaluating the performance of different algorithms. Provide a brief comparison between time complexity and space complexity analysis. 10[CO-5] [L-vii]
8. Create a class that represents a car. Include class attributes such as the number of wheels and class methods to calculate the average speed of all cars created.
 - Write a program to instantiate multiple car objects and access their class attributes and methods. 10[CO-2] [L-vii]
9. Create a base class called "Animal" with attributes and methods common to all animals.
 - Derive a subclass called "Mammal" from the "Animal" class with additional attributes and methods specific to mammals.
 - Further derive a subclass called "Dog" from the "Mammal" class with specific attributes and methods for dogs.
 - Write a program to instantiate a dog object, access its inherited attributes and methods, and invoke the dog-specific ones. 10[CO-5] [L-vii]