Silver Oak University
Silver Oak College of Computer Application
Bachelor of Computer Application

Semester:	3	**Academic Year:**	2024-25
Course Name:	Python Development	**Course Code:**	**3040243202**

Question bank

Sr. No.	Question Text	Marks	CO
Unit No: 1			
1	What is the difference between a variable and a constant in Python? Give examples.		
2	Explain the different data types available in Python with examples.		
3	What is type conversion in Python? How do you convert a string to an integer?		
4	Write a python program to swap two numbers without using a temporary variable.		
5	Explain how an `if-elif-else` statement works in Python. Write a Python code that checks if a number is positive, negative, or zero.		
6	What is the purpose of the `else` clause in a loop? Provide an example using a `for` loop.		
7	Write a Python program that checks if a given year is a leap year or not.		
8	Describe how the `try-except` block is used in Python for handling exceptions. Provide an example.		
9	Differentiate between `for` and `while` loops in Python. Provide examples where each loop is more appropriate.		
10	Write a Python program to print the Fibonacci sequence up to `n` terms using a loop.		
11	What is a nested loop? Write a Python program using nested loops to print a multiplication table up to 10x10.		

12	How does the `break` statement differ from the `continue` statement in loops? Provide examples.		
13	How can you access individual characters and substrings in a Python string? Write a code to extract and print the first three characters of a given string.		
14	Write a Python program that counts the number of vowels in a given string.		
15	Explain how the `input()` function works in Python. Write a program that takes a user's name and age as input and prints a message saying, "Hello, [Name], you are [Age] years old!"		
Unit No: 2			
16	What is string slicing in Python? Provide an example to extract a substring from a given string.		
17	Explain how the `split()` and `join()` methods work in Python. Provide examples for each.		
18	Write a Python program to check if a given string is a palindrome (reads the same forwards and backwards).		
19	What are the key differences between lists and tuples in Python? Provide examples to illustrate your answer.		
20	Explain immutability in the context of tuples. Why might you choose to use a tuple over a list in Python?		
21	Given a tuple `(10, 20, 30, 40)`, write a Python code to unpack the elements into four variables.		
22	How do you add, remove, and update elements in a Python list? Provide examples for each operation.		
23	Explain how dictionaries differ from lists in Python. What are some use cases where a dictionary would be more appropriate than a list?		
24	Write a Python program that counts the frequency of each word in a given sentence using a dictionary.		
25	Explain the concept of "first-class objects" in Python. How does this relate to functions in Python?		
26	Write a Python program that takes a function as an argument and applies it to every element in a list. Use a simple function like squaring a number as the example.		
27	What is black-box testing? How does it differ from glass-box (white-box) testing? Provide examples of each.		
28	What are some common techniques for debugging Python programs? Describe the use of the `print()` function and the `pdb` module for debugging.		
29	What is exception handling in Python? How do you use `try`, `except`, `finally`, and `else` blocks in Python? Provide a code example.		
30	What are assertions in Python, and how are they used? Provide an example where assertions might be useful in validating function input.		
	Unit No: 3		

31	What is an Abstract Data Type (ADT), and how does it differ from a data structure? Provide an example of an ADT in Python.		
32	Explain the purpose of a class in Python. How do classes support the concept of ADTs?		
33	What is inheritance in Python? How does it promote code reuse? Provide an example of a parent class and a derived class.		
34	Explain the binary search algorithm. What are the prerequisites for using binary search? Write a Python function that performs binary search on a sorted list.		
35	Describe the bubble sort algorithm. What is its time complexity? Write a Python function that implements bubble sort.		
36	What is encapsulation in object-oriented programming? How does Python enforce encapsulation? Provide an example.		
Unit No: 4			
37	What is a regular expression (regex) in Python, and why is it useful? Provide an example of a regex pattern that matches a valid email address.		
38	Explain the difference between the `search()`, `match()`, and `findall()` functions in the `re` module. Provide examples of when to use each.		
39	Write a Python program using regular expressions to extract all the dates from a given text in the format `dd-mm-yyyy`.		
40	How can you use regular expressions to replace all occurrences of a specific word in a text with another word? Provide a code example.		
41	What is PyLab in Python, and how does it relate to Matplotlib? Describe the main functionalities provided by PyLab.		
42	Write a Python script using PyLab to plot a sine wave. Include labels for the axes, a title, and a grid.		
43	Explain how to create a subplot in PyLab. Write a Python script that displays two plots side by side: a sine wave and a cosine wave.		
44	How can you save a plot created in PyLab as an image file? Provide an example with code.		
45	What is a socket in networking, and how is it used in Python for client-server communication? Provide a basic example of a socket-based client and server in Python.		
46	Explain the difference between threading and multiprocessing in Python. When would you use one over the other?.		
47	Write a Python program using threading to handle multiple clients connecting to a chat server simultaneously.		
48	How do you handle synchronization between threads in Python to avoid race conditions? Provide an example using the `threading` module.		
49	Describe the key components of a simple chat application using sockets in Python. How would you implement basic message broadcasting to all connected clients?		

50	What are the potential security concerns when developing a chat application using sockets in Python? How can you mitigate these risks?		

Deepika

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