Python introduction & setup:

1. What is Python?

Python is a high level, interpreted programming language known for its readability and simplicity.

2. What are the key features of Python?

Python supports dynamic typing, object oriented programming, interpreted execution and has extensive standard libraries.

3. Is Python compiled (or) interpreted?

Python is interpreted; its code is executed by line-by-line by the python interpreter.

4. What are the main applications of Python?

Python is used in web development, data science, machine learning, automation, scripting, and desktop applications.

5. How do you install Python on your system?

Download from python.org and run the installer. ensure "Add to path" is checked.

6. What is the difference between Python 2 and Python 3?

Python 3 is the future and supports unicode, improved syntax, print () as a function, and

Python 2 is deprecated.

7. How can you checked the installed python version?

use python --version (or) python3 --version in the terminal / command prompt.

6 What is the role of print () function in Python ?

print() outputs data to the console, commonly used for debugging and displaying results.

· What is IDE ? Name a few commonly used Python IDEs.

An IDE (Integrated Development Environment) provides tools for coding. examples: Pycharm, VS Code, IDLE, Jupyter.

How do you run a Python file from the erminal ?

Use python filename.py (or) Python 3 filename.py pending on your system configuration.

: in Python :

What is a variable in Python ?

A variable stores data in memory with name for future reference and operations.

How do you declare a variable in Python ?

imply assign a value using = (eg. x=10 ~~x=10~~) ;

o type declaration is required.

13. Is it necessary to declare the type of a variable in Python?

No, Python is dynamically typed ; the type is inferred at run time.

14. What are the rules for naming variables in Python?

Variable names must start with a letter (or) underscore and cannot contain spaces (or) special charactors.

15. What is the difference between global and local variables?

Global variables are accessible through out the program, while local variables are limited to the function scope.

16. Can a variable name start with a number in Python? Why or why not?

No, it causes a syntax error, Variable names must begin with a letter (or) underscore.

17. What happens if you use a variable without assigning a value?

A name error is raised, as the variable is undefined.

8 How is memory managed for variables in Python?

Python uses automatic memory management via reference counting and garbage collection.

19. Can Python variable names contains special characters like $ or @ ?

No, variables names can't include symbols $ (or) @, only letters, and digits and underscores are allowed.

20. What is the difference between = and == in Python?

= assigns a value, while == checks for equality between two values.

Data types in Python :

21. What are the basic datatype in Python?

Python supports int, float, bool, str, list, tuple, dict, set and complex.

22. What is the difference between int, float, and complex?

int is for whole numbers, float for decimals. And complex for imaginary numbers. (Eg. 3+4j).

23. What is the difference between a list and tuple?

lists are mutable and defined with [ ].

whereas tuples are immutable and defined with ( ).

24. How is a dictionary different from a list?

A dictionary stores key - value pairs, while a list stores ordered values with index - based access.

25. What is set and how it is different from a list?

A set is an unordered collection of unique elements defines using { } and disallows duplicates.

26. What is the difference between mutable and immutable data types?

Mutable types (eg. list, dict) can be changed, immutable types (eg. tuple, str) cannot.

27. What will type ( ) function return if the variable is a string?

type ( ) will return <class 'str'> for string variables.

28. What are Boolean data types?

Boolean values represent truthiness and are either True (or) False.

29. How do you convert data from one type to another in Python?

Use type casting functions like int(), str(), float(), list(), etc.

30. What does the len() function do for different data types?

len() returns the number of elements/items in a sequence like list, string, (or) dictionary keys.

Conditional Statement

31. What are conditional statements in python?

They control the flow of execution based on conditions using if, elif, and else.

32. What is the syntax of an if statement in python

```
if condition:
    # code block.
```

33. What is the difference between if and if-else

if executes when condition is true; if-else handles both true and false cases.

34. What is the use of elif in Python?

elif allows checking multiple conditions after an initial if.

35. Can you use multiple elif blocks in a condition?

Yes, you can chain multiple, elif conditions between if and else.

36. What happens if none of the conditions are true in an if -elif else block?

If else is provided, it's block executes, Otherwise, nothing happens.

37. Can we use if inside another if? Explain with an example?

Yes, nested if statements are allowed for multi level condition checking.

38. How is indentation important in writing Conditionals in Python?

Indentation defines code blocks; improper indentation leads to Identation Error.

39. How do you check multiple conditions using and lor?

Use and to combine conditions that must all be true; or if any conditions can be true.

40. What is the output of if " " or if 0 in Python? Why?

Both are considered False as they are "falsy" values; So the "if" block doesn't run.

For loop in python :

41. what is for loop in python and how it is used ?

A "for" loop is used to iterate ~~owo~~ over ~~sequences~~ like sequences like Strings, (or) ranges.

42. what is the syntax of a for loop ?

```
for item in sequence :
      # loop body.
```

43. How does the range () function work with loops?

range (start, stop, step) generate a sequence of numbers used for controlled looping.

44. Can you loop over strings and lists using for? give examples ?

yes. eg. for char in "hello" (or) for item in [1, 2, 3].

45. What is the use of break and continue inside a loop ?

break exists the loop, while continue skips to the next iteration.

46.

46. How do you print only even numbers between 1 and 20 using a loop?

```
for i in range (1, 21):
    if i % 2 = =0; print (i)
```

47. What is the use of else with a for loop?

The else block runs if the loop completes without encountering a break.

48. What does enumerate () do in a for loop?

enumerate ( ) returns index- value pairs when looping over iterables.

49. What is the nested loop? Provide an example.

A loop inside the another loop; used for multi dimensional data like grids (or) matrices.

50. Can we use for loop with dictionaries? if yes, how?

Yes, use for key, value in dict .items () to iterate key -value pairs.