VIVA VOCE

1. What is Python? What are the benefits of using Python?

Ans. Python is a programming language with objects, modules, threads, exceptions and automatic memory management. The benefits of Python are that it is simple and easy, portable, extensible, built-in data structure and is open source.

2. What is pickling and unpickling?

Ans. Pickle module accepts any Python object and converts it into a string representation and dumps it into a file by using dump function. This process is called pickling. The process of retrieving original Python objects from the stored string representation is called unpickling.

3. How is Python interpreted?

Ans. Python language is an interpreted language. Python program runs directly from the source code. It converts the source code that is written by the programmer into an intermediate language, which is again translated into machine language that has to be executed.

4. How is memory managed in Python?

Ans. Python memory is managed by Python private heap space. All Python objects and data structures are located in a private heap. The programmer does not have access to this private heap and the interpreter takes care of this Python private heap.

- The allocation of Python heap space for Python objects is done by Python memory manager. The core API gives access to some tools for the programmer to code.
- Python also has an inbuilt garbage collector, which recycles all the unused memory, frees up memory, and makes it available to the heap space.

5. What is the difference between list and tuple?

Ans. The difference between list and tuple is that list is mutable while tuple is not. Tuple can be further implemented as a key to dictionaries.

6. What are the built-in types that Python provides?

Ans. There are mutable and immutable types of Python built-in types. Mutable built-in types offered by Python are:

- List
- Sets
- Dictionaries

Immutable built-in types are:

- Strings
- Tuples
- Numbers

7. What is namespace in Python?

Ans. In Python, every name introduced has a place where it lives and can be looked for. This is known as namespace. It is like a box where a variable name is mapped to the object placed. Whenever the variable is searched, this box will be searched to get the corresponding object.

8. What is lambda in Python?

Ans. It is a single expression, anonymous function often used as inline function.

9. What is pass in Python?

Ans. Pass means no-operation Python statement or, in other words, it is a placeholder in compound statement, where there should be a blank left and nothing should be written there.

10. What is slicing in Python?

Ans. A mechanism to select a range of items from sequence types like list, tuple, strings, etc., is known as slicing.

11. What is docstring in Python?

Ans. A Python documentation string is known as docstring. It is a way of documenting Python functions, modules and classes.

12. What is negative index in Python?

Ans. Python sequences can be indexed using both the positive and negative numbers. For positive index, 0 is the first index, 1 is the second index, so on and so forth. For negative index, (–1) is the last index and (–2) is the second last index and so on and so forth.

13. How can you convert a number into a string?

Ans. In order to convert a number into a string, use the inbuilt function str(). If you want an octal or hexadecimal representation, use the inbuilt function oct() or hex().

14. What do you understand by module and package in Python?

Ans. In Python, module is the way to structure a program. Each Python program file is a module which imports other modules like objects and attributes.

The folder of a Python program is a package of modules. A package can have modules or sub-folders.

15. What are the rules for local and global variables in Python?

Ans. **Local variables:** If a variable is assigned a new value anywhere within a function's body, it is assumed to be local.

Global variables: Those variables that are only referenced inside a function are implicitly global.

16. Explain how to delete a file in Python.

Ans. A file can be deleted by using a command os.remove (filename) or os.unlink(filename)

17. Explain how you can generate random numbers in Python.

Ans. To generate random numbers in Python, you need to import command as:

```
import random
random.random()
```

This returns a random floating point number in the range [0,1)

18. What is the use of // operator in Python?

Ans. It is a Floor Division operator which is used for dividing two operands with the result as quotient showing only digits before the decimal point. For instance, 10//5 = 2 and 10.0//5.0 = 2.0.

19. Mention five benefits of using Python.

Ans. (a) Python comprises a huge standard library for most internet platforms like email, HTML, etc.

(b) Python does not require explicit memory management as the interpreter itself allocates memory to new variables and frees them automatically.

(c) Provides easy readability due to the use of square brackets.

(d) Easy-to-learn for beginners.

(e) Having the built-in data types saves programming time and effort from declaring variables.

20. Mention the use of the split function in Python.

Ans. The use of split function in Python is that it breaks a string into shorter strings using the defined separator. It gives a list of all words present in the string.

21. What are literals in Python?

Ans. Python literals can be defined as data which can be assigned to a variable or constant. There are 5 types of literals available in Python:

- String literals
- Numeric literals
- Boolean literals
- Special literals
- Literal Collections

22. Explain Python functions.

Ans. A function is a set of instructions or a block of code that is written once and can be called and executed whenever required in the program. There are two categories of functions in Python:

- Built-in functions
- User-defined functions

23. Name the different file processing modes supported by Python.

Ans. Python provides three modes to work with files:

- Read-only mode
- Write-only mode
- Read-Write mode

24. What is an operator in Python?

Ans. An operator is a particular symbol which is used on some values and produces an output as result.

For example, 10 + 30 = 40

Here, "+" and "=" are operators.

25. What are the different types of operators in Python?

Ans. Following is a list of operators in Python:

- Arithmetic Operators
- Relational Operators
- Assignment Operators
- Logical Operators
- Membership Operators
- Identity Operators
- Bitwise Operators

26. What is a Dictionary in Python?

Ans. Dictionary is an important built-in data type in Python. It defines one-to-one relationship between keys and values. Dictionaries contain a pair of keys and their corresponding values.

Dictionaries are indexed by keys.

27. What is the use of HELP() and DIR() function in Python?

Ans. Both Help() and dir() functions are accessible from the Python interpreter and used for viewing a consolidated collection of built-in functions.

Help(): The help() function is used to display the documentation string and also facilitates you to see the help related to modules, keywords, attributes, etc.

Dir(): The dir() function is used to display the defined symbols.

28. How does Python do compile-time and run-time code checking?

Ans. In Python, some amount of coding is done at compile-time, but most of the checking such as type, name, etc., is held up until the code execution. Consequently, if the Python code references a user-defined function that does not exist, the code will compile successfully. The Python code will fail only with an exception when the code execution path does not exist.

29. Explain the use of TRY: EXCEPT: RAISE: and FINALLY:.

Ans. Try, except and finally blocks are used in Python error-handling mechanism. Code is executed in the try block until an error occurs. Except block is used to receive and handle all errors. Control is transferred to the appropriate except block. In all cases, the finally block is executed. Raise may be used to raise your own exceptions.

30. What is the purpose of PYTHONPATH environment variable?

Ans. PYTHONPATH has a role similar to PATH. This variable tells the Python interpreter where to locate the module files imported into a program. It should include the Python source library directory and the directories containing Python source code.

31. What are the supported data types in Python?

Ans. Python has five standard data types:

- Numbers
- String
- List
- Tuple
- Dictionary

32. What is the difference between lists and tuples?

Ans.

Lists	**Tuples**
Lists are mutable, *i.e.*, they can be edited.	Tuples are immutable (tuples are lists which can't be edited).
Lists are slower than tuples.	Tuples are faster than lists.
Syntax: `list1 = [10, 'Python', 44.5]`	**Syntax:** `tup1 = (10, 'Python' , 44.5)`

33. How will you reverse a list?

Ans. list.reverse() − Reverses items of list in place.

34. What is a string in Python?

Ans. A string in Python is a sequence of alphanumeric characters. They are immutable objects. It means that they don't allow modification once they are assigned a value. Python provides several methods such as join(), replace(), or split() to alter strings.

35. Why is the Return keyword used in Python?

Ans. The purpose of a function is to receive the inputs and return some output.

The return is a Python statement which we can use in a function for sending a value back to its calling function or the operating system.

36. When should you use the "Break" in Python?

Ans. Python provides a break statement to exit from a loop. Whenever the break hits in the code, the control of the program immediately exits from the body of the loop. The break statement in a nested loop causes the control to exit from the inner iterative block.

37. What is a tuple in Python?

Ans. A tuple is a collection of type data structure in Python which is immutable. Tuples are similar to sequences, just like the lists. However, there are some differences between a tuple and a list—the former doesn't allow modifications, the latter does.

Also, the tuples use parentheses for enclosing but the lists have square brackets in their syntax.

38. How do you debug a program in Python? Is it possible to step through the Python code?

Ans. Yes, we can use the Python debugger (**pdb**) to debug any Python program. If we start a program using **pdb**, then it lets us even step through the code.

39. List down some of the PDB commands for debugging Python programs.

Ans. Here are a few PDB commands to start debugging Python code:

- Add breakpoint (b)
- Resume execution (c)
- Step-by-step debugging (s)
- Move to the next line (n)
- List source code (l)
- Print an expression (p)

40. Explain the use of “with” statement.

Ans. In Python, generally “with” statement is used to open a file, process the data present in the file, and also to close the file without calling a close() method. “with” statement makes the exception handling simpler by providing cleanup activities.

General form of with:

with open(“filename”, “mode”) as file-var:

processing statements

41. How can we display the contents of text file in reverse order?

Ans. (a) Convert the given file into a list.

(b) Reverse the list by using reversed()

(c) *Eg*: for line in reversed(list(open(“file-name”,”r”)))

(d) print(line)

42. Differentiate between append() and extend() methods.

Ans. Both append() and extend() methods are methods of list. These methods are used to add elements at the end of the list.

- append(element) – adds the given element at the end of the list which has called this method.
- extend(another-list) – adds the elements of another list at the end of the list which is called the extend method.

43. What are the advantages of Python recursion?

Ans. Implementing something using Python recursion requires less effort. The code we write using recursion will be comparatively smaller than the code that is implemented by loops. Again, codes that are written using recursion are easier to understand also.

44. What do you understand by Python modules?

Ans. A file containing Python definitions and statements is called a Python module. So naturally, the filename is the module name which is appended with the suffix **.py**.

45. What do you understand by Python package?

Ans. Python package is a collection of modules in directories that gives a package hierarchy. More elaborately, Python packages are a way of structuring Python’s module by using “dotted module names”. So A.B actually indicates that B is a sub-module which is under a package named A.

46. How can we get current directory using Python?

Ans. To get current directory in Python, we need to use os module. Then, we can get the location of the current directory by using getcwd() function.

47. What is the difference between del keyword and clear() function?

Ans. The difference between del keyword and clear() function is that while del keyword removes one element at a time, clear function removes all the elements.

48. What is primary key?

Ans. Primary key is a combination of columns that uniquely identifies a row in a relational table.

49. What is candidate key?

Ans. All possible combinations of columns that can possibly serve as the primary key are called candidate keys.

50. What is foreign key?

Ans. A combination of columns where values are derived from primary key of some other table is called the foreign key of the table in which it is contained.

51. What is alternate key?

Ans. A candidate key that is not serving as a primary key is called an alternate key.

52. What is MYSQL?

Ans. MYSQL is an open source RDBMS that relies on SQL for processing the data in the database. The database is available for free under the terms of General Public License (GPL).

53. What is RDBMS?

Ans. Relational Database Management System (RDBMS) facilitates access, security and integrity of data and eliminates data redundancy. *For example*, MYSQL, Oracle, Microsoft Sql Server, etc.

54. What is the use of drop command?

Ans. Drop command is used to delete tables. *For example*, Drop Table Orders. Delete commands are used to delete rows of a table.

55. What do you understand by NOT NULL constraint?

Ans. This constraint ensures that the null values are not permitted on a specified column. This constraint can be defined at the column level and not at the table level.

56. What is the significance of COUNT?

Ans. It is used to count the number of values in a given column or number of rows in a table. *For example*, Select count (Roll No.) from students.

57. How can we delete a table in MYSQL?

Ans. We can delete a table in MYSQL using the drop command.

58. How can we delete a record in MYSQL?

Ans. We can delete a record in MYSQL using the delete command.

59. How can we add a record and add a column in a table?

Ans. We can add a record by using insert command and we can add a column through the alter table command.

60. Give any two differences between GET and POST submission methods of HTML form.

Ans.

GET Method	**POST Method**
All form data is encoded into the URL appended to the action URL as query string parameters.	Form data appears within the message body of the HTTP request.
Parameters remain in browser history, hence cannot be used to send password-like sensitive information.	Parameters are not saved in browser history, hence can be used to send sensitive information.
Can be bookmarked.	Cannot be bookmarked.
Easier to hack for script kiddies.	More difficult to hack.
Can be cached.	Cannot be cached.

61. Give the necessary command to incorporate SQL interface within Python.

Ans. import MySQLdb

62. What is Django?

Ans. Django is a high-level Python web framework that encourages rapid development and clean, pragmatic design. Developed by a fast-moving online news operation, Django was designed to handle two challenges: the intensive deadlines of a newsroom and the stringent requirements of the experienced web developers who wrote it. It lets you build high-performing, elegant web applications quickly.