

UNIT-II

PART A

DATA, EXPRESSIONS AND STATEMENTS

1. Define python

Python is an object-oriented, high level language, interpreted, dynamic and multipurpose programming language.

2. Give the features of python.

- Easy to Use:
- Expressive Language
- Interpreted Language
- Cross-platform language
- Free and Open Source
- Object-Oriented language
- Extensible

3. What is python interpreter?

The engine that translates and runs Python is called the Python Interpreter: There are two ways to use it: immediate mode and script mode. The >>> is called the Python prompt. The interpreter uses the prompt to indicate that it is ready for instructions.

4. What is the difference between intermediate mode and script mode?

- In immediate mode, you type Python expressions into the Python Interpreter window, and the interpreter immediately shows the result.
- Alternatively, you can write a program in a file and use the interpreter to execute the contents of the file. Such a file is called a script. Scripts have the advantage that they can be saved to disk, printed, and so on.

4. What is meant by value in python?

A value is one of the fundamental things—like a letter or a number—that a program manipulates.

5. List the standard data types in python.

Python has five standard data

Types:

- Numbers
- Strings
- List,
- Tuples
- Dictionary

6. What is meant by python numbers?

Number data types store numeric values. Number objects are created when you assign a value to them.

Python supports four different numerical types :

- int (signed integers)
- long (long integers, they can also be represented in octal and hexadecimal)
- float (floating point real values)
- complex (complex numbers)

7. What are python strings?

Strings in Python are identified as a contiguous set of characters represented in the quotation marks. Python allows for either pairs of single or double quotes. Subsets of strings can be taken using the slice operator ([] and [:]) with indexes starting at 0 in the beginning of the string and working their way from -1 at the end.

The plus (+) sign is the string concatenation operator and the asterisk (*) is the repetition operator.

```
str = 'Hello World!'
```

```
print str[0]    # Prints first character of  
the string o/p:
```

H

8. Mention the features of lists in python

Lists are the most versatile of Python's compound data types. A list contains items separated by commas and enclosed within square brackets ([]). To some extent, lists are similar to arrays in C. One difference between them is that all the items belonging to a list can be of different data type.

The values stored in a list can be accessed using the slice operator ([] and [:]) with indexes starting at 0 in the beginning of the list and working their way to end -1. The plus (+) sign is the list concatenation operator, and the asterisk (*) is the repetition operator. For example

—

```
list = [ 'abcd', 786 , 2.23,'john', 70.2 ] print list[0]
```

o/p

a

b

c

d

9. What is tuple ? What is the difference between list and tuple?

- A tuple is another sequence data type that is similar to the list. A tuple consists of a number of values separated by commas.
- The main differences between lists and tuples are: Lists are enclosed in brackets ([]) and their elements and size can be changed, while tuples are enclosed in parentheses (()) and cannot be updated. Tuples can be thought of as **read-only** lists. Eg:

```
tuple = ( 'abcd', 786 , 2.23, 'john', 70.2 )
```

10. Give the features of python dictionaries

Python's dictionaries are kind of hash table type. They work like associative arrays and consist of key-value pairs. A dictionary key can be almost any Python type, but are usually numbers or strings. Values, on the other hand, can be any arbitrary Python object. Dictionaries are enclosed by curly braces ({ }) and values can be assigned and accessed using square braces ([]). For example – dict = { }

```
dict['one'] = "This is one"
```

11. What is a variable?

One of the most powerful features of a programming language is the ability to manipulate variables. A variable is a name that refers to a value. The assignment statement gives a value to a variable.

Eg:

```
>>> n = 17
```

```
>>> pi = 3.14159
```

12. What are the rules for naming a variable?

Variable names can be arbitrarily long. They can contain both letters and digits, but they have to begin with a letter or an underscore. Although it is legal to use uppercase letters, by convention we don't. If you do, remember that case matters. Bruce and bruce are different variables.

The underscore character (_) can appear in a name.

Eg:

```
my_name
```

13. What are keywords?

Keywords are the reserved words in Python. We cannot use a keyword as variable name, function name or any other identifier. They are used to define the syntax and structure of the Python language. In Python, keywords are case sensitive. There are 33 keywords in Python.

Eg:

```
False, class, finally, return
```

14. What are the rules for writing an identifier?

- Identifiers can be a combination of letters in lowercase (a to z) or uppercase (A to Z) or digits (0 to 9) or an underscore (_). Names like myClass, var_1 and print_this_to_screen, all are valid example.
- An identifier cannot start with a digit. 1variable is invalid, but variable1 is perfectly fine. Keywords cannot be used as identifiers.
- We cannot use special symbols like !, @, #, \$, % etc. in our
- identifier. Identifier can be of any length.

15. what are expressions?

An expression is a combination of values, variables, operators, and calls to functions. If you type an expression at the Python prompt, the interpreter evaluates it and displays the result:

```
>>> 1 + 1=2
```

16. What is a statement?

A statement is an instruction that the Python interpreter can execute. When you type a statement on the command line, Python executes it. Statements don't produce any result. For example, a = 1 is an assignment statement. if statement, for statement, while statement etc. are other kinds of statements.

17. What is multiline statement?

In Python, end of a statement is marked by a newline character. But we can make a statement extend over multiple lines with the line continuation character (\).

For example:

```
a = 1 + 2 + 3 + \  
4 + 5 + 6 + \  
7 + 8 + 9
```

18. What is docstring?

Doc string is short for documentation string. It is a string that occurs as the first statement in a module, function, class, or method definition. It is used to explain in brief, what a function does.

19. What is a function? Mention the type of function and use.

A Function can be called as a section of a program that is written once and can be executed whenever required in the program, thus making code reusability.

There are two types of Functions.

- a) Built-in Functions: Functions that are predefined. We have used many predefined functions in Python.
- b) User- Defined: Functions that are created according to the requirements.

20. Mention the types of arguments in python

1.python default arguments.

2.python keyword argument

3.python arbitrary
argument

21. What is meant by module in python?

A module is a file consisting of Python code. A module can define functions, classes and variables. A module can also include runnable code.

22. List some built in modules in python

There are many built in modules in Python. Some of them are as follows:math, random , threading , collections , os , mailbox , string , time , tkinter etc..

23. What is the use of dir() function?

The dir() built-in function returns a sorted list of strings containing the names defined by a module. The list contains the names of all the modules, variables and functions that are defined in a module.

26. What operators does python support?

- Arithmetic Operators
- Comparison (Relational) Operators
- Assignment Operator
- Logical Operators
- Bitwise Operators
- Membership Operators
- Identity Operator

27. What is an Arithmetic operator?

Arithmetic operators are used to perform mathematical operations like addition, subtraction, multiplication etc.

The operators are: +,-,/,%,*,**

28. What is the use of comparison operator?

Comparison operators are used to compare values. It either returns True or False according to the condition.

>,<,>=,<=,==,!=

29. What are logical operators and Bitwise operators?

Logical operators are the and, or, not operators. Bitwise operators act on operands as if they were string of binary digits. It operates bit by bit, hence the name.

The operators are:&,&|,^,>>,<<

30. What are assignment statements?

Assignment operators are used in Python to assign values to variables.a = 5 is a simple assignment operator that assigns the value 5 on the right to the variable a on the left.

31. Mention the features of identity operators?

is and is not are the identity operators in Python. They are used to check if two values (or variables) are located on the same part of the memory. Two variables that are equal does not imply that they are identical.

32. Give the characteristics of membership operator?

in and not in are the membership operators in Python. They are used to test whether a value or variable is found in a sequence (string, list, tuple, set and dictionary). In a dictionary we can only test for presence of key, not the value.

Operator	Meaning	Example
in	True if value/variable is found in the sequence	5 in x
not in	True if value/variable is not found in the sequence	5 not in x

PART B

1. Explain the data types in python
2. Illustrate interpreter and interactive mode in python with example.
3. Explain function and module with suitable example
4. Write short notes on types of operators in python with appropriate example
5. Explain briefly constant, variables, expression, keywords and statements available in python
6. Write the following python programs.
 - a. Exchange the value of two variables
 - b. Calculate the value of n variables
 - c. Test whether a given year is leap year or not
 - d. To find the sum of n natural numbers
 - e. To find whether a given number is Armstrong number or not
 - f. To print Fibonacci series
 - g. To find factorial of a given number
 - h. To convert Celsius to Fahrenheit