DEPARTMENT OF ELECTRICAL ENGINEERING

UNIVERSITY COLLEGE OF ENGINEERING (AUTONOMOUS)
OSMANIA UNIVERSITY

CLASS: BE-(EEE)
SEMESTER: VII
CLASS TEST: I
ACADEMIC YEAR: 2025-2026
SUBJECT: Python Programming – Module I

Time: 1.30 hours **Max. Marks: 30**

Note: Pseudo code here refers to logic/explanation or steps. Precise python syntax is not mandatory.

PART – A (2X5=10 Marks) Answer all questions				
		Marks	BT	CO
1. a)	Name any four key components of a computer?	2	1	1
b)	Name any four inbuilt python functions?	2	1	2
c)	What is type casting in python and explain with one example?	2	2	1
d)	Create an infinite loop in python using any loop construct (pseudo code)?	2	4	1
e)	Write pseudo code to swap two numbers using a temporary variable (e.g., if a =3 and b=4, the program should return a=4 and b=3)	2	3	1
PART – B (2x10=20 Marks) Answer all questions				
2. a	Name five differences in features between C/C++ and Python?	5	1	1
b	Write Algorithm and flowchart to print even numbers between 9 and100?	5	3	2
3 a	Write an algorithm and draw flow chart to find the smallest of two numbers?	5	3	1
3. b	Write an algorithm and draw flowchart to find the sum of the series 1+2+3+….N	5	3	1
b	Explain each python data type/structure below with an example with its syntax? 1. Numeric data types (integer and float) 2. Strings 3. Lists 4. Tuples 5. Dictionary	10	2	2

Solutions:

1a) Any four among below,

- **Central Processing Unit (CPU) -** Known as the brain of the computer, it performs calculations and processes instructions for the system to function.
- **Random Access Memory (RAM) -** Temporary memory that stores data and programs currently in use for quick access.
- **Storage Devices –** Include Hard Disk Drives (HDDs) or Solid-State Drives (SSDs) or EEPROMs where data and programs are permanently stored.
- **Input Devices -** Such as keyboard and mouse, used to interact with the computer.
- **Output Devices -** Such as monitor and speakers, used to display or output information from the computer.
- **Power Supply Unit (PSU) -** Converts electricity from an outlet to power the computer components.

1b) Any four among below,

- abs() - Returns the absolute value of a number
- bin() - Converts an integer to a binary string
- bool() - Converts a value to a Boolean (True or False)
- int() - Converts a value to an integer
- float() - Converts a value to a floating point number
- len() - Returns the length of an object
- print() - Prints output to the console
- str() - Converts a value to a string
- list() - Creates a list from an iterable
- dict() - Creates a dictionary
- input() - Allows user input
- max() - Returns the maximum value in an iterable
- min() - Returns the minimum value in an iterable
- round() - Rounds a number to a given precision
- sorted() - Returns a sorted list from an iterable

1c) Type casting in Python is the process of converting a variable from one data type to another. This allows you to perform specific operations that require data in a certain type. Python provides both implicit and explicit methods for typecasting.

Implicit type casting:

```
c = 1.9   # float
d = 8     # integer
result = c + d  # d is implicitly converted to a float
print(result)   # Output: 9.9
```

Here, the integer d is automatically converted to a float to match c during the addition.

Explicit type casting:

```
num_string = '12'
# Explicitly cast string to integer
num_integer = int(num_string)
```

1d)

```
stmt = True
while stmt:
  # code to be executed repeatedly
```

As long as stmt written is True, while will not come of the loop and always execute the statement inside.

1e)

```
a = 3
b = 4
temp = a
a = b
b = temp
```

2a) Any five among below,

Feature	C/C++	Python
Language Level	Low-level (closer to Hardware)	High-level (close to human language)
Syntax Style	Complex, verbose	Simple and readable
Compilation	Explicit (compiler + linker) covert to Machine language	Implicit (Interpreter compiles to bytecode)
Execution	Run directly on CPU	Bytecode runs on Python Virtual Machine (PVM) - CPython
Error Detection	Syntax error caught at compile time	Caught during runtime (line-by-line execution)
Platform Dependence	Yes (platform specific binary)	No (runs on all platforms with interpreter)
Variable Declaration	Must declare Type	No Type declaration
Memory Management	Manual (handle with pointers)	Automatic
Speed	Faster	Slower
Application Domains	Systems programming, Networking, Embedded and Platforms building	General-purpose, high-level apps, Complex computation tasks (AI/ML and data engineering)

2b) Replace 1 with 9 and 50 with 100 in below Algorithm and flow chart

Algorithm & Flowchart to find Even number between 1 to 50

Algorithm

Step-1 Start

Step-2 I = 1

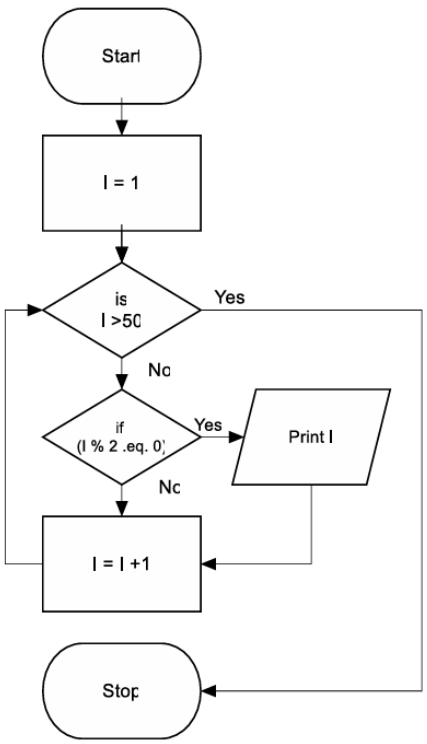
Step-3 IF (I >50) THEN
GO TO Step-7
ENDIF

Step-4 IF ((I % 2) =0) THEN
Display I
ENDIF

Step-5 I = I + 1

Step-6 GO TO Step--3

Step-7 Stop



3a)

Algorithm & Flowchart to find the smallest of two numbers

Algorithm

Step-1 Start

Step-2 Input two numbers say

NUM1,NUM2

Step-3 IF NUM1 < NUM2 THEN

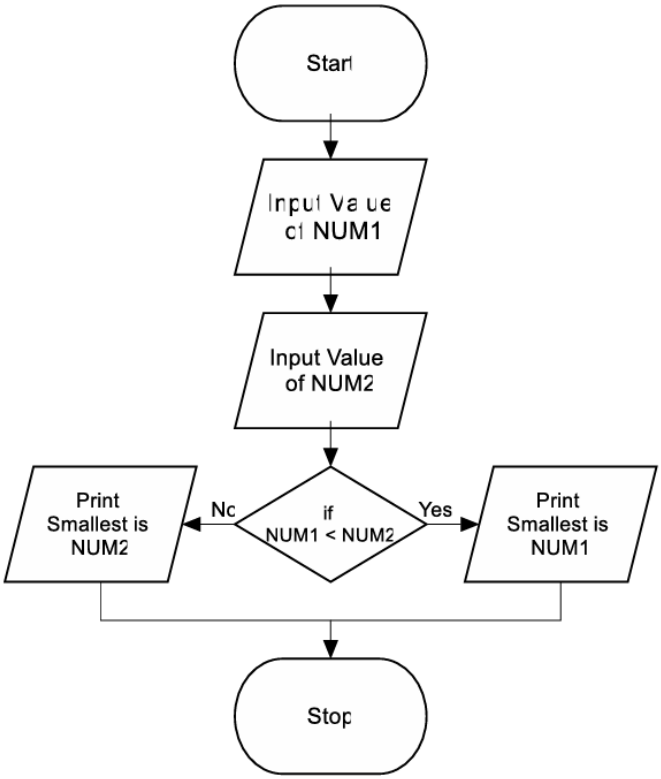
print smallest is NUM1

ELSE

print smallest is NUM2

ENDIF

Step-4 Stop



3b)

Algorithm & Flowchart to find sum of series 1+2+3+…..+N

Algorithm

Step-1 Start

Step-2 Input Value of N

Step-3 I = 1, SUM=0

Step-4 IF (I >N) THEN

GO TO Step-8

ENDIF

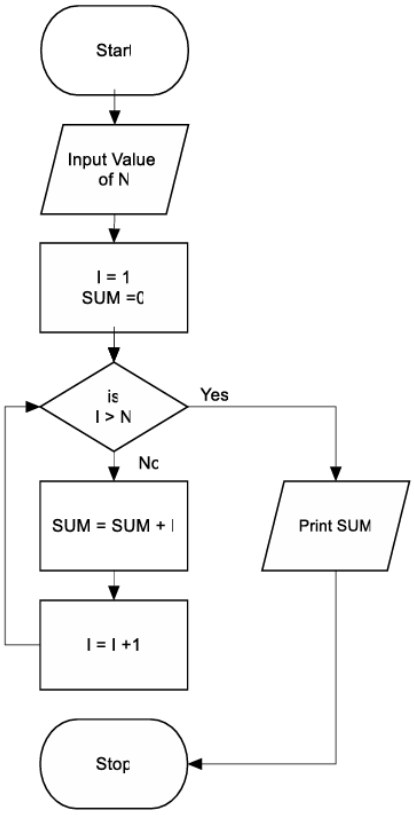
Step-5 SUM = SUM + I

Step-6 I = I + 1

Step-7 Go to step-4

Step-8 Display value of SUM

Step-9 Stop



4)

1. Numeric Data Types

Integer (int)

- Represents whole numbers without decimals.
- Can be positive, negative, or zero.
- Example syntax:
  age = 25
  print(type(age)) *# Output: <class 'int'>*

Float (float)

- Represents numbers with decimals (floating-point numbers).
- Used for real numbers.
- Example syntax:
  price = 19.99
  print(type(price)) *# Output: <class 'float'>*

2. Strings (str)

- Text data type enclosed in quotes (single or double).
- Stores sequences of characters.
- Example syntax:
  message = "Hello, Python!"
  print(type(message)) *# Output: <class 'str'>*

3. Lists (list)

- Ordered, mutable collection of items.
- Items can be of mixed data types.
- Defined with square brackets [].
- Example syntax:
  fruits = ["apple", "banana", "cherry"]
  fruits[1] = "blueberry" *# Lists are mutable*
  print(fruits) *# Output: ['apple', 'blueberry', 'cherry']*

4. Tuples (tuple)

- Ordered, but immutable collection of items.
- Items can be of mixed data types.
- Defined with parentheses ().
- Example syntax:
  coordinates = (10, 20)
  # coordinates[0] = 15 # This will cause an error because tuples are immutable
  print(type(coordinates)) *# Output: <class 'tuple'>*

5. Dictionary (dict)

- Unordered collection of key-value pairs.
- Keys are unique; values can be any data type.
- Defined with curly braces {}.
- Example syntax:
  person = {"name": "John", "age": 30}
  print(person["name"]) *# Output: John*
  person["age"] = 31 *# Dictionaries are mutable*