44 (SEM–5) BCA–HE–5046

2024

(Held in 2025)

PROGRAMMING IN PYTHON

Paper : BCA–HE–5046

Full Marks : 60

Time : Three hours

The figures in the margin indicate full marks for the questions.

1. Answer the following : 1×12=12

   (i) What is flowchart ?

   (ii) What is identifier ?

   (iii) What is the use of range (...) ?

   (iv) keyword is used to define a function in Python. *(Fill in the blank)*

   (v) What is the use of the keyword 'pass' in Python ?

   (vi) What do you mean by class ?

   (vii) Python code is interpreted by the interpreter. *(State True **or** False)*

(viii) What is the use of the special method __str__ method in a class ?

(ix) Can a Python function return multiple values ?

(x) Give the syntax of 'while statement'.

(xi) What is the main difference between '/' and '//' operator in Python ?

(xii) a, b = 2, 3

In the above Python statement what are the values stored in the variable a, b ?

2. Answer the following questions : 2×8=16

(i) State the differences tuples and lists in Python?

(ii) What is string repetition operator in Python ? Give one example.

(iii) Write one recursive function to find the factorial of a number.

(iv) What are the different arithmetic operators available in Python ?

(v) What are lists in Python ? What is string slicing?

(vi) Mention some uses of NumPy ? Does NumPy come with the built-in Python library ?

(vii) What do you mean by Algorithm? Mention some characters of good algorithms.

(viii) Define scope and lifetime of a variable.

3. Answer the following : ***(any three)*** 4×3=12

(i) What is problem solving? What are different steps? Explain briefly.

(ii) Define the following :

(a) Problem Definition

(b) Program Design

(c) Debugging

(d) Documentation

(iii) What is list comprehension? Explain with suitable example.

(iv) Write the advantages and disadvantages of Flowchart as problem solving tool.

(v) Explain different ways to format output using Python *print*(...) function with suitable example.

(vi) Write the differences between : *(any one)*

(a) Call by Value and Call by Reference.

(b) Bottom-Up Approach and Top-Down Approach

(vii) What is Decision Tree ? State one use. Mention one advantage of Decision tree.

4. Answer the following : ***(any four)*** 5×4=20

(i) Write program to check whether a number is prime or composite.

(ii) Explain different types of inheritance with suitable example in Python.

(iii) Create a class Animal with a method make_sound( ). Add two subclasses Dog and Cat that override the make_sound( ) method.

(iv) Create a class to represent complex numbers of the form A+iB, where *i* is the square root of −1. Give the magic methods for addition, subtraction of complex numbers.

(v) Write a program/function to implement Binary Search algorithm.

(vi) Write a program to implement stack data structure. Give methods/functions for standard stack operations like push(), pop(), is_empty(), is_full().