PAPER ID-311051

**Roll No:**

**BTECH**
**(SEM V) THEORY EXAMINATION 2023-24**
**PROGRAMMING, DATA STRUCTURES AND ALGORITHMS USING PYTHON**
TIME: 3 HRS                                                                      M.MARKS: 100

**Note: 1.** Attempt all Sections. If require any missing data; then choose suitably.

### SECTION A

**1.    Attempt *all* questions in brief.**                                        2 x 10 = 20

| Qno. | Question | Marks | CO |
|---|---|---|---|
| a. | State any two characteristics of python programming language. | 2 | 1 |
| b. | Tell how to initialize a string in python? | 2 | 1 |
| c. | Differentiate between an array and a list. | 2 | 2 |
| d. | Explain slicing. | 2 | 2 |
| e. | Define a function in python. | 2 | 3 |
| f. | Define global scope with respect to functions. | 2 | 3 |
| g. | What is a stack? | 2 | 4 |
| h. | Define a queue in python. | 2 | 4 |
| i. | Explain Big-O notation. | 2 | 5 |
| j. | Define dynamic programming. | 2 | 5 |

### SECTION B

**2.    Attempt any *three* of the following:**                                    10 x 3 = 30

| | | | |
|---|---|---|---|
| a. | Explain in detail the various data types in python? | 10 | 1 |
| b. | Explain the use of tuples and dictionaries. Use valid examples and their associated operations. | 10 | 2 |
| c. | What is a file handle. Explain its utility and significance with examples. | 10 | 3 |
| d. | Explain the various commands related to queues and stacks in python. | 10 | 4 |
| e. | Write a program for multiplication of two matrices in python. | 10 | 5 |

### SECTION C

**3.    Attempt any *one* part of the following:**                                 10 x 1 = 10

| | | | |
|---|---|---|---|
| a. | Summarize – break, continue and pass with examples. | 10 | 1 |
| b. | Briefly explain the functions of python IDE's. | 10 | 1 |

**4.    Attempt any *one* part of the following:**                                 10 x 1 = 10

| | | | |
|---|---|---|---|
| a. | Explain various list operations with suitable examples. | 10 | 2 |
| b. | Explain and write the program for selection sort. | 10 | 2 |

**5.    Attempt any *one* part of the following:**                                 10 x 1 = 10

| | | | |
|---|---|---|---|
| a. | Explain the various commands related to reading of files in python. | 10 | 3 |
| b. | Summarize with examples write related commands in python programming. | 10 | 3 |

**6.    Attempt any *one* part of the following:**                                 10 x 1 = 10

| | | | |
|---|---|---|---|
| a. | Briefly explain classes and objects in python. Write any valid program to explain them. | 10 | 4 |
| b. | Summarize search trees in python. Briefly explain binary trees. | 10 | 4 |

**7.    Attempt any *one* part of the following:**                                 10 x 1 = 10

| | | | |
|---|---|---|---|
| a. | Write a python program to calculate simple greatest common divisor (gcd) and explain it. | 10 | 5 |
| b. | Summarize a python program for Euclid's algorithm for gcd. | 10 | 5 |