(6 pages) **Reg. No. : .....**

Code No. : 10844 E **Sub. Code : FCDS 21/ FCCD 21/FCAD 21**

B.Sc. (CBCS) DEGREE EXAMINATION, APRIL 2026.

Second Semester

Data Science/Computer Science with Data Science/ Artificial Intelligence and Data Science — Core

PROGRAMMING WITH PYTHON

(For those who joined in July 2024 onwards)

Time : Three hours Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. Python is a
   (a) compiled language
   (b) interpreted language
   (c) machine language
   (d) assembly language

2. The function used to read input from the console in Python is
   (a) input() (b) read()
   (c) sean() (d) getInput()

3. Which one of the following is an example of exit controlled loop?
   (a) while (b) for
   (c) if (d) do-while

4. The purpose of if statement in Python is
   (a) to loop through a sequence
   (b) to execute a lock conditionally
   (c) to define a function
   (d) to handle exceptions

5. Which keyword is used for function in Python language?
   (a) Function (b) Def
   (c) Fun (d) Define

6. Python supports creation of anonymous functions at runtime, using a construct called
   (a) pi (b) anonymous
   (c) lambda (d) both (b) and (c)

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7. The time complexity of the find() function is

(a) O(log n) (b) O(n^2)

(c) O(n) (d) O(1)

8. What is the output of "python".capitalize()?

(a) "Python" (b) "python"

(c) "PYTHON" (d) "pYTHON"

9. Ordered sequence of elements of different data types such as integer, float, string or list is

(a) tuple

(b) dictionaries

(c) list

(d) none of these

10. Elements of tuples are enclosed in

(a) parenthesis

(b) curly brackets, commas

(c) both (a) and (b)

(d) none of these

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) Explain the History of Python

Or

(b) Explain identifiers and keywords with example.

12. (a) Explain while loop with example.

Or

(b) Explain continue statement with example.

13. (a) Explain function call.

Or

(b) Explain recursion with example.

14. (a) Explain immutable strings in Python.

Or

(b) Explain nested lists with example.

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15. (a) Explain the difference between lists and tuples.

Or

(b) Explain dictionary functions and methods.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Explain the features of Python.

Or

(b) Explain how to define and process arrays.

17. (a) Explain any two iterative statements with example.

Or

(b) Explain any two jumping statements with example.

18. (a) Explain the scope and lifetime of a variable.

Or

(b) Explain the various function arguments.

19. (a) Explain the various string operations.

Or

(b) Explain the basic list operations.

20. (a) Explain how to create, access, update and delete elements in a tuple.

Or

(b) Explain dictionary methods in detail.

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Code No. : 10847 E **Sub. Code : FSDS 21/ FSAI 21/FSCD 21/ FSAD 21**

B.Sc. (CBCS) DEGREE EXAMINATION, APRIL 2026.

Second Semester

Data Science/Artificial Intelligence/Computer Science with Data Science/Artificial Intelligence and Data Science

Skill Enhancement Course — DATA STRUCTURES

(For those who joined in July 2024 onwards)

Time : Three hours Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. How are elements stored in a 2D array in memory?

   (a) linear (b) sequential

   (c) row-major order (d) parallel

2. What is the time complexity to count the number of elements in the linked list?

   (a) O(n) (b) O(log n)

   (c) O(n log n) (d) O(1)

3. In a stack, if a user tries to remove an element from an empty stack is called ————————

   (a) overflow (b) underflow

   (c) both (a) and (b) (d) none of these

4. A queue follows ———————— principle.

   (a) FIFO (b) LIFO

   (c) SJF (d) none of these

5. A graph is a tree if and only if graph is

   (a) Directed graph

   (b) Contains no cycles

   (c) Planar

   (d) Completely connected

6. The number of edges in a complete graph of n vertices is

   (a) n(n+1)/2 (b) n(n-1)/2

   (c) n2/2 (d) n

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7. Which of the following method is used for sorting in merge sort?

(a) partitioning

(b) merging

(c) exchanging

(d) selection

8. How many passes does an insertion sort algorithm consist of

(a) N (b) N-1

(c) N+1 (d) N2

9. Who coined the term 'backtracking"?

(a) Lehmer (b) Donald

(c) Ross (d) Ford

10. In what manner is a state-space tree for a backtracking algorithm constructed?

(a) Depth-first search

(b) Breadth-first search

(c) Twice around the tree

(d) Nearest neighbour first

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) Explain the complexity analysis.

Or

(b) Explain the steps to insert element in a doubly linked list.

12. (a) Explain various tree terminologies.

Or

(b) Explain binary tree with example.

13. (a) Define spanning trees. Give some examples.

Or

(b) Explain Kruskal's algorithm.

14. (a) Explain the concept of sorting.

Or

(b) Write a program to explain binary search.

15. (a) Explain some applications of graph coloring.

Or

(b) Explain backtracking in-Queen's problem.

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PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Explain doubly linked list.

Or

(b) Explain how to insert element at the beginning and in between nodes in singly linked list.

17. (a) Explain queue in detail.

Or

(b) Explain the ways of representing binary trees.

18. (a) Explain the linked representation of graphs.

Or

(b) Explain graph traversals.

19. (a) Explain binary search with example.

Or

(b) Explain merge sort with example.

20. (a) Explain the various types of graph coloring.

Or

(b) Briefly explain travelling salesman problem.

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