

Roll No.

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Course Code: BSDB31201T

Examination (January - 2024)
Bachelor of Science (B.Sc. – Data Science)
Semester - II
Operating System

Time Allowed: 3 Hours

Max. Marks: 70

Instructions for the Students

1. Attempt any 2 questions out of 4 from Section – A (Each question carries 10 marks)
2. Attempt any 2 questions out of 4 from Section – B (Each question carries 10 marks)
3. Attempt any 10 questions out of 15 from Section – C (Each question carries 03 marks)

Section - A

2*10=20

- Q1.** Explain the components and interactions of an operating system structure, detailing three key services.
- Q2.** Define processes, describe operations, and compare multithreading models against single-threaded processes.
- Q3.** Discuss deadlock system models and characterize prevention, avoidance, and detection strategies with recovery mechanisms.
- Q4.** Examine memory management components, address binding, and delve into contiguous memory allocation, segmentation, paging, demand paging, and page replacement algorithms.

Section - B

2*10=20

- Q5.** Explain file system components, access methods, and allocation methods, emphasizing free-space management.
- Q6.** Define Linux's shell and kernel, outlining file system usage, including filenames, directories, and key Linux directories.
- Q7.** Discuss essential Linux commands, file operations, and permissions, including chmod and file ownership changes.
- Q8.** Illustrate shell scripting in Linux, covering variables, positional parameters, and conditional and iteration statements.

Section - C

10*3=30

Q9. Short Answer Questions (Attempt any 10 questions)

- a) What are the primary components of computer-system organization, and how do they contribute to the overall architecture?
- b) Explain the basic concepts of process scheduling and list two scheduling criteria.
- c) Briefly describe one method for handling deadlocks in an operating system.
- d) Define dynamic linking and loading in the context of memory management.
- e) Name two elements of file-system structure and their roles.
- f) Enumerate three features of the Linux operating system.
- g) Differentiate between a parent directory and a subdirectory in Linux.
- h) Provide a short explanation of the 'ls' command in Linux.
- i) How do you assign a value to a variable in shell scripting?
- j) Name one type of system call and briefly describe its purpose.
- k) Mention one operation that can be performed on processes.
- l) What is the significance of access methods in file systems?
- m) Define contiguous memory allocation and its advantages.
- n) How can you change file ownership in Linux?
- o) Provide a short description of the 'if' statement in shell scripting.