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Paper ID: BSD201 **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.