

Question Paper

Exam Date & Time: 25-Nov-2023 (02:00 PM - 05:00 PM)



MANIPAL ACADEMY OF HIGHER EDUCATION

Manipal School of Information Sciences (MSIS), Manipal
First Semester Master of Engineering - ME (Cloud Computing) Degree Examination - November / December 2023

Linux and Data Structures [CDC 5104]

Marks: 100

Duration: 180 mins.

Saturday, November 25, 2023

Answer all the questions.

- 1)
 - a) What are stacks (10)
 - b) Write algorithms for PUSH and POP operations on the stack
 - c) List any two applications of stack (CO3) (2+6+2)
- 2)
 - a) Write function to add an item into a singly linked list and display the list (10)
 - b) Write function to search an element from a singly linked list. (CO3) (6+4)
- 3) How do you analyze the performance of an algorithm? (CO3) (10) (10)
- 4) Write functions for (10)
 - a) In-order
 - b) Pre-order
 - c) Post-order traversals and print output for each traversal I a binary tree. (CO3) (3+3+4)
- 5) Write function for sorting N numbers using Heap Sort. Derive its time complexity. (CO3) (7+3) (10)
- 6) Write code for the SINGLE SOURCE SHORTEST PATHS problem. Illustrate this with an example. (10)
(CO3) (5+5)
- 7)
 - a. What is meant by context switch and describe how it takes place. (10)
 - b. Explain the terms: (i) multiprogramming (ii) multitasking (CO1) (5+5)
- 8) Define an O.S. and provide an abstract view of the same. Also list and explain the responsibilities of a general purpose operating system. (CO2) (5+5) (10)
- 9) What do you understand by message passing? Explain this scheme under (i) direct communication and (ii) indirect communication. (CO2) (2+8) (10)
- 10) Describe the Software approach to solve the critical section problem. Illustrate how this approach cannot solve the problem without special hardware support? (CO2) (7+3) (10)

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