



End Term (Odd) Semester Examination December 2024

Roll no.....

Name of the Course and semester: MCA 1ST SEM

Name of the Paper: ADVANCED OPERATING SYSTEM

Paper Code: TMC 104

Time: 3 hour

Maximum Marks: 100

Note:

- (i) All the questions are compulsory.
- (ii) Answer any two sub questions from a, b and c in each main question.
- (iii) Total marks for each question is 20 (twenty).
- (iv) Each sub-question carries 10 marks.

Q1.

(2X10=20 Marks)

- a. Define operating system. Also, explain the layered architecture of an operating system. (CO1)
- b. Discuss the file organization concepts in UNIX and WINDOWS. How it is different from each other. (CO6)
- c. A disk has 200 cylinders numbered from 0 to 199. The current head position is at cylinder 53. The request queue contains the following cylinders in the order they arrive: 98, 183, 37, 122, 14, 124, 65, 67. Determine the total head movement for LOOK and C-LOOK scheduling algorithms, assuming the head moves towards higher-numbered cylinders first. (CO1)

Q2.

(2X10=20 Marks)

- a. Draw and explain the RTOS architecture. Also, explain the RTOS kernel and its functions. (CO2)
- b. For the following tasks:
Task 1: Period = 5ms, Execution Time = 1ms
Task 2: Period = 10ms, Execution Time = 2ms
Task 3: Period = 20ms, Execution Time = 4ms
Schedule these tasks using the Rate Monotonic (RM) algorithm for the first 20ms and show the timeline. (CO2)
- c. Explain different types of kernels. Explain the different types of real-time operating systems based on its attributes. (CO2)

Q3.

(2X10=20 Marks)

- a. Differentiate between parallel and distributed systems, providing examples of applications that benefit from each. (CO3)
- b. Explain the distributed systems. Also, explain its various types. (CO3)
- c. Write different applications in which distributed systems implemented. Explain any one application covering all the hardware and software details. (CO3)

Q4.

(2X10=20 Marks)

- a. Draw and explain the building block diagram of a virtualization environment. Illustrate the role of the hypervisor in virtualization architecture. (CO4)
- b. Write a shell scripting to count the number of lines, words and characters in a file. Explain the access permissions in file. (CO5)
- c. Explain the fundamental characteristics of cloud computing? Differentiate between SaaS, PaaS, and IaaS, providing examples for each. (CO4)

Q5.

(2X10=20 Marks)

- a. Differentiate between Process and Threads. Describe the process scheduling mechanisms in Linux and Windows. (CO5)
- b. Explain the following with example: (i) Multiprocessing (ii) Multitasking (iii) Multiprogramming (CO5)
- c. Write command with syntax and description with example of following : (i) create a file (ii) append a file (iii) hardlink (iv) softlink (v) listing all file with inode number. (CO6)

