SNS COLLEGE OF TECHNOLOGY

(An Autonomous Institution)
Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai
Accredited by NAAC-UGC with 'A++' Grade (Cycle III) &
Accredited by NBA (B.E - CSE, EEE, ECE, Mech&B.Tech.IT)
COIMBATORE-641 035, TAMIL NADU

Reg. No: | | | | | | | | | | | | |

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B.E/B.Tech- Internal Assessment – III
Academic Year 2024-2025 (Even Semester)
Fourth Semester
23CST202–Operating Systems
(Common to CSE,IT& AIML)

Time: 1 1/2 Hours **Maximum Marks: 50**

Answer All Questions
PART – A(5*2=10 Marks)

		CO	Blooms	Industry /GATE Ref
1.	Illustrate with an example how a linked allocation method works in file storage.	CO4	**APP**	-
2.	Compare and contrast single-level and hierarchical directory structures.	CO4	**ANA**	-
3.	Differentiate between RAID Level 0 and RAID Level 1 in terms of data redundancy and performance.	CO4	**ANA**	-
4.	A 300 GB disk uses a file descriptor with 8 direct block addresses, 1 indirect, and 1 doubly indirect block address. With 128-byte disk blocks and 8-byte addresses, what is the maximum file size?	CO5	**APP**	**GATE CSE 2012**
5.	Describe how the NTFS file system manages disk space and file metadata.	CO5	**UND**	**Microsoft Question**

PART – B (2*13=26 Marks) & (1*14=14 Marks)

		CO	Blooms	Industry /GATE Ref
6.	(a) Analyze the different file allocation methods (contiguous, linked, and indexed). Discuss their advantages, disadvantages, and the type of applications where each is most suitable (OR)	CO4	**ANA**	-
	(b)Evaluate the various directory structures (single-level, two-level, tree-structured, acyclic graph, and general graph). Discuss how they impact file sharing, access efficiency, and protection in a multi-user environment.	CO4	**ANA**	-
7.	(a)Critically evaluate various disk scheduling algorithms such as FCFS, SSTF, LOOK, and C-SCAN. Compare their performance in terms of seek time and system responsiveness using suitable examples. (OR)	CO5	**APP**	-
	(b)Explain the strategies used in disk management and swap-space management. Compare various disk scheduling algorithms and	CO5	**APP**	-

	justify which algorithm would be most suitable for a real-time operating system. Additionally, design a memory management plan incorporating swap-space for a system running multiple large applications concurrently."			
8.	(a) Design and evaluate a robust file system suitable for a cloud or mobile operating system. Your design should explain file access methods, directory structures, file system mounting, sharing, and protection. Additionally, analyze how mass storage components such as disk scheduling, RAID, and swap-space management can be optimized for performance. Use relevant case studies (e.g., Google File System, Amazon S3, or Apple iCloud) to support your arguments. (OR)	CO5	**APP**	**GOOGLE**
	(b)(i)If 100 libraries are loaded at startup, each requiring one disk access, with a seek time of 10 ms and a rotational speed of 6000 rpm, how long does it take to load all libraries? (ii)A FAT-based file system uses 4-byte entries. Given a 100 MB disk and 1 KB data blocks, what is the maximum file size?	CO5	**APP**	**GATE CSE 2011** **GATE CSE 2014**

Bloom's Taxonomy:

REM – Remember **UND** – Understand **APP**– Apply **ANA**– Analyze**EVA -** Evaluate

Faculty In charge **Teaching Coordinator** **HoD** **Dean**