

Operating System (315319)

MSBTE Diploma · K-Scheme · Computer Engineering group, Semester 5 · Important Questions

How this list was made: Based on MSBTE papers **W-2025** and **S-2026** available on msbte.ac.in (these are the only two K-scheme papers of this course so far). Every question of both papers was grouped by topic. **High** = asked in both papers, **Medium** = asked in one paper, **Low** = in the K-scheme syllabus but not asked yet. Practice guidance only — not a prediction of the exam.

Most repeated topics

#	Topic	Unit	Times asked
1	Schedulers – types (long / short / medium term), CPU scheduler	3	3 (S-26, W-25)
2	Deadlock – necessary conditions, prevention, avoidance, Banker's algorithm	4	3 (S-26, W-25)
3	Types of OS (real time, distributed, mobile, multiprogrammed vs multitasking)	1	3 (S-26, W-25)
4	Operating system services (list / describe with example)	2	2 (S-26, W-25)
5	System calls – types with examples / process control system calls	2	2 (S-26, W-25)
6	Process states / process state diagram	3	2 (S-26, W-25)
7	Thread – definition and benefits	3	2 (S-26, W-25)
8	Multithreading models (many-to-one, one-to-one, many-to-many)	3	2 (S-26, W-25)
9	Linux process commands (ps, kill, sleep, wait, exit)	3	2 (S-26, W-25)
10	Scheduling criteria / terms (turnaround time, throughput, waiting time ...)	4	2 (S-26, W-25)

Unit I – Overview of Operating System

Question / topic	Marks	Asked in	Probability
Types of OS (real time, distributed, mobile, multiprogrammed vs multitasking) <ul style="list-style-type: none"> Explain real time system; two applications. (W-25 Q.2a) What is OS? Distributed OS and Mobile OS with example. (W-25 Q.6a) Differentiate between multi-programmed and multitasking OS. (S-26 Q.2a) 	4 M, 6 M	S-26, W-25	High
Linux vs Windows (command line vs GUI OS) <ul style="list-style-type: none"> Major differences between Linux and Windows. (W-25 Q.1d) 	2 M	W-25	Medium
Batch, time-sharing and multiprocessor OS In syllabus, not asked yet — prepare for a surprise question.	—	Not yet	Low

Unit II – Services and Components of OS

Question / topic	Marks	Asked in	Probability
Operating system services (list / describe with example) <ul style="list-style-type: none"> State any four operating system services. (W-25 Q.1a) Describe any six services of operating system with example. (S-26 Q.5a) 	2 M, 6 M	S-26, W-25	High
System calls – types with examples / process control system calls <ul style="list-style-type: none"> Enlist four process control system calls. (W-25 Q.1b) List the types of system calls. Give examples of each. (S-26 Q.3a) 	2 M, 4 M	S-26, W-25	High
OS components – process management, main memory management, file / I/O management <ul style="list-style-type: none"> Activities of main memory management and process management. (S-26 Q.4a) 	4 M	S-26	Medium
OS tools – user management, security policy, device management, performance monitor, task scheduler In syllabus, not asked yet — prepare for a surprise question.	—	Not yet	Low

Unit III – Process Management

Question / topic	Marks	Asked in	Probability
Schedulers – types (long / short / medium term), CPU scheduler <ul style="list-style-type: none"> State the meaning of scheduler. Explain any one type of scheduler. (W-25 Q.4e) List the types of scheduler and describe function of each. (S-26 Q.2b) State the function of CPU scheduler. (S-26 Q.1d) 	2 M, 4 M	S-26, W-25	High
Process states / process state diagram <ul style="list-style-type: none"> Draw and explain process state diagram. (W-25 Q.3a) List the different states of process. (S-26 Q.1a) 	2 M, 4 M	S-26, W-25	High
Thread – definition and benefits <ul style="list-style-type: none"> Define thread. Enlist two benefits of thread. (W-25 Q.1e) Describe the benefits of using threads in an operating system. (S-26 Q.3b) 	2 M, 4 M	S-26, W-25	High
Multithreading models (many-to-one, one-to-one, many-to-many) <ul style="list-style-type: none"> Explain any two multithreading models with suitable diagram. (W-25 Q.3d) Describe many-to-one multithreading model with suitable diagram. (S-26 Q.4b) 	4 M	S-26, W-25	High
Linux process commands (ps, kill, sleep, wait, exit) <ul style="list-style-type: none"> Output of: sleep 12, ps -u User1, wait 2535088. (W-25 Q.5b) 	2 M, 6 M	S-26, W-25	High

<ul style="list-style-type: none"> State the use of PS command and kill command in Linux. (S-26 Q.1b) 			
Process Control Block (PCB) <ul style="list-style-type: none"> Explain process control block with neat diagram. (W-25 Q.4d) 	4 M	W-25	Medium
Inter Process Communication – shared memory, message passing <ul style="list-style-type: none"> Explain IPC. Shared memory with advantages and disadvantages. (S-26 Q.6a) 	6 M	S-26	Medium
Context switch and scheduling queues In syllabus, not asked yet — prepare for a surprise question.	—	Not yet	Low
User level vs kernel level threads In syllabus, not asked yet — prepare for a surprise question.	—	Not yet	Low

Unit IV – CPU Scheduling and Deadlock

Question / topic	Marks	Asked in	Probability
Deadlock – necessary conditions, prevention, avoidance, Banker's algorithm <ul style="list-style-type: none"> Describe necessary conditions leading to deadlock. (W-25 Q.4b) Define deadlock, avoidance, prevention; Banker's algorithm. (W-25 Q.5c) Define deadlock prevention. Explain any two methods. (S-26 Q.5b) 	4 M, 6 M	S-26, W-25	High
Scheduling criteria / terms (turnaround time, throughput, waiting time ...) <ul style="list-style-type: none"> Define turnaround time, throughput. (W-25 Q.1c) Explain any four scheduling criteria. (S-26 Q.4c) 	2 M, 4 M	S-26, W-25	High
Round Robin / SRTN scheduling – explain with example <ul style="list-style-type: none"> Describe SRTN and Round Robin scheduling with suitable example. (W-25 Q.6b) Describe Round-Robin scheduling with example. (S-26 Q.2c) 	4 M, 6 M	S-26, W-25	High
Scheduling numerical (FCFS, SJF, Priority – average WT / TAT) <ul style="list-style-type: none"> Average waiting time for SJF, FCFS, Priority. (W-25 Q.5a) Average turnaround time using FCFS and SJF non-preemptive. (S-26 Q.6c) 	6 M	S-26, W-25	High
Preemptive vs non-preemptive scheduling <ul style="list-style-type: none"> Define non-preemptive scheduling. (S-26 Q.1c) 	2 M	S-26	Medium
Multilevel queue scheduling In syllabus, not asked yet — prepare for a surprise question.	—	Not yet	Low
Banker's algorithm numerical (safe sequence) In syllabus, not asked yet — prepare for a surprise question.	—	Not yet	Low

Unit V – Memory Management

Question / topic	Marks	Asked in	Probability
Paging vs segmentation (any four points) <ul style="list-style-type: none"> Differentiate between paging and segmentation. (W-25 Q.4c) Differentiate between paging and segmentation. (S-26 Q.3c) 	4 M	S-26, W-25	High
Page replacement numerical (FIFO, Optimal, LRU) <ul style="list-style-type: none"> Page faults with FIFO and optimal, 3 frames. (W-25 Q.6c) Page faults using FIFO and optimal, frame size 3. (S-26 Q.6b) 	6 M	S-26, W-25	High
Free space management – bitmap, linked list <ul style="list-style-type: none"> Explain free space management: bitmap, linked list. (W-25 Q.2c) Describe bitmap free space management with example. (S-26 Q.4d) 	4 M	S-26, W-25	High
Virtual memory / page fault <ul style="list-style-type: none"> Define term page fault. (W-25 Q.1g) Define virtual memory. (S-26 Q.1f) 	2 M	S-26, W-25	High
Memory partitioning (fixed / variable) and fragmentation <ul style="list-style-type: none"> Explain the concept of variable partitioning. (W-25 Q.2b) Define fragmentation with its types. (S-26 Q.1e) 	2 M, 4 M	S-26, W-25	High
Paging – working with paging hardware diagram <ul style="list-style-type: none"> Working of paging with diagram of paging hardware. (S-26 Q.5c) 	6 M	S-26	Medium
Memory allocation – first fit, best fit, worst fit <ul style="list-style-type: none"> Describe first fit, best fit, worst fit with example. (W-25 Q.4a) 	4 M	W-25	Medium
LRU page replacement numerical In syllabus, not asked yet — prepare for a surprise question.	—	Not yet	Low

Unit VI – File Management

Question / topic	Marks	Asked in	Probability
Directory structure (single, two-level, tree) <ul style="list-style-type: none"> Describe two level directory structure with advantages and disadvantages. (W-25 Q.2d) Explain the tree-structured directory with a diagram. (S-26 Q.2d) 	4 M	S-26, W-25	High
File allocation methods (contiguous, linked, indexed) <ul style="list-style-type: none"> Differentiate between linked and indexed file allocation. (W-25 Q.3c) List disadvantages of contiguous file allocation method. (S-26 Q.4e) 	4 M	S-26, W-25	High
File operations <ul style="list-style-type: none"> List any four file operations. (W-25 Q.1f) Describe any four file operations. (S-26 Q.3d) 	2 M, 4 M	S-26, W-25	High
File types and extensions <ul style="list-style-type: none"> Three file types with extensions; need of file extension. (W-25 Q.3b) 	4 M	W-25	Medium
File access methods (sequential, direct) <ul style="list-style-type: none"> Describe direct access method with one example. (S-26 Q.1g) 	2 M	S-26	Medium

File attributes and sequential access In syllabus, not asked yet — prepare for a surprise question.	—	Not yet	Low
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Exam tips from the two papers

- Both papers had **two 6-mark numericals**: a CPU scheduling problem (FCFS / SJF / Priority) and a page replacement problem (FIFO + Optimal, 3 frames). Practise Gantt charts and frame tables until they are quick.
- **Paging vs segmentation** was asked in exactly the same words in both papers.
- Diagrams expected: process state diagram, PCB, multithreading models, paging hardware, directory structures, file allocation methods, bitmap / linked free list.
- Linux commands (ps, kill, sleep, wait) appear every time — learn their purpose, syntax and sample output.

Note: This is a **important-question list prepared by Ananda Technologies** only for practice and exam preparation, based on the pattern of previous MSBTE question papers and the K-scheme syllabus. It is **not an official MSBTE paper**, and it does **not** mean that these questions will come in the exam. Answers follow standard textbook points; marks shown are indicative. Free for students — anandatechnologies.in