

DKTE Society's
Yashwantrao Chavan Polytechnic, Ichalkaranji
Department of Computer Science and Engineering

**Chapter-wise Frequently Asked Questions.
Operating System (22516)**

Chapter 1. Overview of Operating System			
Sr. No.	Question	Asked in Exam	For Marks
1	List and draw a neat labeled diagram of four components of a computer system. Explain any one in detail.	W17, S18, W19	2,4,4
2	Explain Time sharing operating system, state its advantages and dis-advantages	W17,S18,S22	4,4,4
3	Explain multiprogramming operating system.	W17,W18,W19,W21	4,4,4,4
4.	Describe real time system state its examples	W17,W18,W19,S17, S19,W21	4,4,4,4,4
5.	Explain multiprocessor system and its two types. State and describe any two advantages of multi-processor system.	S17,S19 S22	4,4 2
Chapter 2. Services and Components of Operating System			
1.	List any four services provided by OS and explain any two of them.	W17,S18,W18, W19,S22,S17,S19, W21	4,4,2,4,4,4,6,2
2.	What is system call? Enlist any four system calls related with process management.	W17,S18,W18,W19, S22,S17,S19, W21	4,4,2&4, 4&4, 4, 4&4&4, 4,4
3.	List operating system tools and explain any 2 in detail	S22,W21	4,4
Chapter 3. Process Management			
1	State and explain different process state.	W17,S18,W18,W19, S22, W21	4,4,4,4,2,2
2.	Draw and explain process control block in detail.	W17,W18,S17,S19	6,4,4,4
3.	With suitable diagram describe scheduling queues.	W19,S22	4,4
4.	Explain Short Scheduler and Long Term Scheduler? Differentiate between short term and long term scheduler?	W17,S17,W19,W21	4,2,4,4
5.	Explain the concept of context switching?	W17,S17,W18,S18, W19,S19	4,2,4,4,4,4
6.	Draw and explain Inter-process communication model.	W17,W18,S18,W19, S19,W21,S22	4,4,6,4,6,4,4

7.	List and explain various types of multi-threading models with diagram. Benefits of multithreading and user level and kernel level threads.	W17,S17,W18,W19, S19,W21,S22	8,6,4&2, 4,4&4&8,4, 6															
8.	Describe use of ps and wait commands with suitable example. Explain ‘PS’ command with any four options. Give commands to perform following tasks: i) To add delay in script ii) To terminate a process Write syntax of following commands: (i) Sleep (ii) Kill Write Unix command for following: (i) Create a folder OSY (ii) Create a file FIRST in OSY folder (iii) List / display all files and directories. (iv) Write command to clear the screen	S22 W21 S22 W21 W21	4 4 2 2 4															
Chapter 4. CPU Scheduling and Algorithms																		
1	Describe CPU and I/O burst cycle with suitable diagram.	W18,S18,W21	4,6,4															
2.	Describe the terms: (i) Preemptive scheduling (ii) Non preemptive scheduling. Differentiate between pre-emptive and non-pre-emptive scheduling	W17,W18,S18 S19,S22	4,4,4 4,4															
3.	State and explain criteria used for CPU scheduling. State any four criteria in CPU scheduling? List four process scheduling criteria and explain the term Turnaround in detail.	W17,S17,W21,S22 W18 S18	4,4,4,4 2 4															
4.	The job are scheduled for execution as follows solve the problem using: (ii) FCFS Also find average waiting time using Gantt chart. <table border="1"><thead><tr><th>Process</th><th>Arrival</th><th>Burst time</th></tr></thead><tbody><tr><td>P1</td><td>0</td><td>8</td></tr><tr><td>P2</td><td>1</td><td>4</td></tr><tr><td>P3</td><td>2</td><td>9</td></tr><tr><td>P4</td><td>3</td><td>5</td></tr></tbody></table> Consider the following four jobs.	Process	Arrival	Burst time	P1	0	8	P2	1	4	P3	2	9	P4	3	5	W17, W18	4 4
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	<p>Describe FCFS (First come first served) algorithm with example.</p> <p>Explain first come first served (FCFS) algorithm. Give one example. State any one advantage and one disadvantage.</p> <p>The jobs are scheduled for execution as follows, Solve the problem using: FCFS and find average waiting time using Gantt chart.</p> <table><tr><th>Process</th><th>Arrival Time</th><th>Burst Time</th></tr><tr><td>P1</td><td>0</td><td>7</td></tr><tr><td>P2</td><td>1</td><td>4</td></tr><tr><td>P3</td><td>2</td><td>10</td></tr><tr><td>P4</td><td>3</td><td>6</td></tr><tr><td>P5</td><td>4</td><td>8</td></tr></table> <p>Calculate average waiting time for following data using First Come First Served (FCFS)</p> <table><tr><th>Process</th><th>Burst time</th><th>Arrival time</th></tr><tr><td>P0</td><td>08</td><td>0</td></tr><tr><td>P1</td><td>04</td><td>1</td></tr><tr><td>P2</td><td>05</td><td>2</td></tr><tr><td>P3</td><td>03</td><td>3</td></tr></table>	Process	Arrival Time	Burst Time	P1	0	7	P2	1	4	P3	2	10	P4	3	6	P5	4	8	Process	Burst time	Arrival time	P0	08	0	P1	04	1	P2	05	2	P3	03	3	<p>W19</p> <p>S19</p> <p>W21</p> <p>S22</p>	<p>4</p> <p>8</p> <p>3</p> <p>6</p>
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	<p>Calculate average waiting time for SJF scheduling Algorithm.</p> <table><tr><th>Jobs</th><th>Arrival Time</th><th>Processing time</th></tr><tr><td>A</td><td>0</td><td>3</td></tr><tr><td>B</td><td>1</td><td>1</td></tr><tr><td>C</td><td>2</td><td>5</td></tr><tr><td>D</td><td>3</td><td>4</td></tr></table> <p>Calculate average locating time for SJF (Shortest Job First) for following table.</p> <table><tr><th>Process</th><th>Burst time</th></tr><tr><td>P₁</td><td>10</td></tr><tr><td>P₂</td><td>04</td></tr><tr><td>P₃</td><td>09</td></tr><tr><td>P₄</td><td>06</td></tr></table> <p>Calculate average waiting time for following data using Shortest Job First(SJF)</p> <table><tr><th>Process</th><th>Burst time</th><th>Arrival time</th></tr><tr><td>P0</td><td>08</td><td>0</td></tr><tr><td>P1</td><td>04</td><td>1</td></tr><tr><td>P2</td><td>05</td><td>2</td></tr><tr><td>P3</td><td>03</td><td>3</td></tr></table> <p>The jobs are scheduled for execution as follows, Solve the problem using: SJF and find average waiting time using Gantt chart.</p> <table><tr><th>Process</th><th>Arrival Time</th><th>Burst Time</th></tr><tr><td>P1</td><td>0</td><td>7</td></tr><tr><td>P2</td><td>1</td><td>4</td></tr><tr><td>P3</td><td>2</td><td>10</td></tr><tr><td>P4</td><td>3</td><td>6</td></tr><tr><td>P5</td><td>4</td><td>8</td></tr></table> <p>Explain Shortest Remaining Time Next (SRTN) scheduling algorithm with example.</p>	Jobs	Arrival Time	Processing time	A	0	3	B	1	1	C	2	5	D	3	4	Process	Burst time	P ₁	10	P ₂	04	P ₃	09	P ₄	06	Process	Burst time	Arrival time	P0	08	0	P1	04	1	P2	05	2	P3	03	3	Process	Arrival Time	Burst Time	P1	0	7	P2	1	4	P3	2	10	P4	3	6	P5	4	8	<p>W19</p> <p>S19</p> <p>S22</p> <p>W21</p> <p>S19</p>	<p>3</p> <p>4</p> <p>6</p> <p>3</p> <p>4</p>
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7.	<p>Explain Round Robin algorithm with suitable example.</p> <p>Consider the following set of processes, with the length of the CPU burst given in milliseconds.</p> <table><tr><th>Process</th><th>Burst Time</th><th>Priority</th></tr><tr><td>P₁</td><td>10</td><td>3</td></tr><tr><td>P₂</td><td>1</td><td>1</td></tr><tr><td>P₃</td><td>2</td><td>3</td></tr><tr><td>P₄</td><td>1</td><td>4</td></tr><tr><td>P₅</td><td>5</td><td>2</td></tr></table> <p>Find out average waiting time by using (ii) Round Robin(RR) (Quantum=1)</p> <p>Calculate average waiting time for following scheduling Algorithm.</p> <p>1) Round Robin scheduling algorithm (Time slice : 2 m sec)</p> <table><tr><th>Jobs</th><th>Arrival Time</th><th>Processing time</th></tr><tr><td>A</td><td>0</td><td>3</td></tr><tr><td>B</td><td>1</td><td>1</td></tr><tr><td>C</td><td>2</td><td>5</td></tr><tr><td>D</td><td>3</td><td>4</td></tr></table> <p>Calculate average locating time for Round Robin (RR) for following table. (Time slice 4 m sec).</p> <table><tr><th>Process</th><th>Burst time</th></tr><tr><td>P₁</td><td>10</td></tr><tr><td>P₂</td><td>04</td></tr><tr><td>P₃</td><td>09</td></tr><tr><td>P₄</td><td>06</td></tr></table>	Process	Burst Time	Priority	P ₁	10	3	P ₂	1	1	P ₃	2	3	P ₄	1	4	P ₅	5	2	Jobs	Arrival Time	Processing time	A	0	3	B	1	1	C	2	5	D	3	4	Process	Burst time	P ₁	10	P ₂	04	P ₃	09	P ₄	06	<p>W17,W18,W21</p> <p>S17</p> <p>W19</p> <p>S19</p>	<p>4,4,4</p> <p>4</p> <p>3</p> <p>4</p>
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8.	With neat diagram, explain multilevel queue scheduling.	S17,W18	4,4																																											
9.	<p>Enlist and describe in details conditions leading to Deadlocks.</p> <p>Write steps for Banker’s Algorithm to avoid dead lock. Also give one example showing working of Banker’s Algorithm.</p> <p>Write steps for Banker’s algorithm to avoid deadlock.</p> <p>Define Deadlock.</p>	<p>W17,S17,W18,W21</p> <p>S17</p> <p>W18,S19,S22</p> <p>W18</p>	<p>4,4,4,4</p> <p>8</p> <p>4,4,4</p> <p>2</p>																																											

	<p>List four Deadlock prevention condition and explain the following terms.</p> <p>1) Removal of “No preemption” condition. 2) Elimination of “Circular wait” related to deadlock prevention condition.</p> <p>Explain Deadlock Avoidance with example.</p> <p>Enlist the deadlock prevention methods and describe any two in detail.</p> <p>Describe prevention of deadlock occurrence with respect to hold and wait necessary condition.</p> <p>Describe the algorithm for finding out whether or not a system is in a safe. State (Safety Algorithm)</p>	<p>S18</p> <p>S18</p> <p>W19</p> <p>S22</p> <p>W19</p>	<p>6</p> <p>4</p> <p>8</p> <p>4</p> <p>4</p>
Chapter 5. Memory Management			
1	<p>Explain static and dynamic memory partitioning method.</p> <p>Describe fixed and variable memory partitioning techniques with suitable diagram. Also state advantage and disadvantage of each.</p> <p>With suitable diagram, describe the concept of variable partitioning of memory.</p> <p>Explain partitioning and its types.</p> <p>Give difference between External fragmentation and Internal fragmentation</p> <p>Define the term fragmentation in terms of memory.</p>	<p>W18</p> <p>W19</p> <p>S22</p> <p>W21</p> <p>S18</p> <p>S22</p>	<p>4</p> <p>8</p> <p>4</p> <p>4</p> <p>4</p> <p>2</p>
2.	<p>Explain Bit map free-space management technique.</p> <p>With suitable example, describe any one free space management technique.</p>	<p>S17,S18</p> <p>S22,W21</p>	<p>4,4</p> <p>4,4</p>
3.	<p>Describe virtual memory management.</p> <p>Explain concept of virtual memory with diagram.</p> <p>Describe the concept of virtual memory with respect to paging. Also draw paging hardware diagram and describe its working with example.</p> <p>Define virtual memory.</p>	<p>W18</p> <p>S19,W17</p> <p>S22</p> <p>W21</p>	<p>4</p> <p>4,4</p> <p>6</p> <p>2</p>

4.	Compare paging and segmentation memory management techniques.	W17,S17,S19	4,6,6
5.	What is the concept of paging? Describe the concept of paging with neat labeled diagram.	W18 W19	2 4
6.	Explain FIFO (First in First out) page replacement algorithm for reference string 7012030423103. Consider the following page reference string arrival with three page frames:-5, 6, 7, 8, 9, 7, 8, 5, 9, 7, 8, 7, 9, 6, 5, 6Calculate number of page faults with optimal and FIFO (First In First Out) page replacement algorithms. Explain LRU page replacement algorithm for following reference string. 70120304230321201701 Calculate page fault	W17 S22 W21	4 6 6

Chapter 6. File Management

1	List and explain any four attributes of file. Describe concept of file, its types and operations on file attributes in detail. Explain different file attributes. Describe any four file attributes.	W17 S18 S19 W21	4 8 4 2
2.	Explain any six file operations performed by OS. State and describe any four operations on file. List any four operations performed on a file.	W17 W19 S22	6 4 2
3.	Explain following file allocation methods: 1) Contiguous 2) Linked List different file allocation method. Describe indexed allocation method with advantage and disadvantage. Give difference between contiguous file allocation and linked file allocation with respect to access,	W17 W18 W18 W19	4 2 4 4

	<p>fragmentation, size and speed.</p> <p>List different file allocation methods. Explain any one in detail.</p> <p>Describe linked file allocation method with suitable example. Also list its one advantage.</p> <p>Enlist different file allocation methods? Explain contiguous allocation method in detail.</p>	<p>S19</p> <p>S22</p> <p>W21</p>	<p>4</p> <p>4</p> <p>6</p>
4.	<p>With neat diagram, explain file access methods.</p> <p>State type of file access method?</p> <p>Describe working of sequential and direct access method.</p> <p>Explain different file access methods.</p> <p>Describe sequential and direct access method.</p>	<p>S17</p> <p>W18</p> <p>W18</p> <p>S19</p> <p>W21</p>	<p>4</p> <p>2</p> <p>4</p> <p>6</p> <p>4</p>
5.	<p>Explain two level Directory Structure with suitable diagram.</p> <p>Explain single level directory structure.</p> <p>Explain the working of Two-level directory structure with neat labeled diagram.</p> <p>Describe with suitable diagram two level directory structure. Also state its two advantages.</p> <p>List different directory structure and explain any one in detail.</p> <p>Describe following directory structures in short with neat sketches:</p> <p>i) Single level</p> <p>ii) Two level</p> <p>iii) Tree structured</p>	<p>S17</p> <p>W18</p> <p>S18</p> <p>W19</p> <p>S19</p> <p>S22</p>	<p>4</p> <p>4</p> <p>4</p> <p>4</p> <p>4</p> <p>6</p>