Dr. D.Y. Patil Institute of Technology, Pimpri, Pune-18

Department of Artificial Intelligence & Data Science

Subject- Operating System

Question Bank

Unit 2: Process Management

<table>
<tr><td>1</td><td>With the help of neat, explain in detail process state transition diagram with two suspend states.</td><td>7</td></tr>
<tr><td>2</td><td>Consider the set of processes with arrival time, burst time and priority.
<table>
<tr><th>Process</th><th>Arrival time</th><th>Burst Time</th></tr>
<tr><td>P1</td><td>7</td><td>5</td></tr>
<tr><td>P2</td><td>3</td><td>4</td></tr>
<tr><td>P3</td><td>10</td><td>3</td></tr>
<tr><td>P4</td><td>0</td><td>8</td></tr>
<tr><td>P5</td><td>12</td><td>6</td></tr>
</table>
Find average turnaround time and average waiting time for SJF (Preemptive) and Round Robn (Time Quantum=2) scheduling algorithms with the help of Gantt chart.</td><td>8</td></tr>
<tr><td>3</td><td>Discuss with the help of neat diagram different thread models.</td><td>5</td></tr>
<tr><td>4</td><td>List and explain the CPU scheduling criteria.</td><td>5</td></tr>
<tr><td>5</td><td>For the table given below calculate average waiting time and average turnaround time and draw a Gantt Chart illustrating the process execution using following scheduling algorithms.
i) RR (Time slice-2units) ii) SJF (non-preemptive)
<table>
<tr><th>Process</th><th>Arrival Time</th><th>Burst Time</th></tr>
<tr><td>Pl</td><td>0</td><td>8</td></tr>
<tr><td>P2</td><td>1</td><td>5</td></tr>
<tr><td>P3</td><td>3</td><td>3</td></tr>
<tr><td>P4</td><td>4</td><td>1</td></tr>
<tr><td>P5</td><td>6</td><td>4</td></tr>
</table></td><td>8</td></tr>
<tr><td>6</td><td>Suppose that a process spawns another process using fork system call. What if the parent process completes the execution before child process?</td><td>2</td></tr>
</table>

<table>
<tr><td>7</td><td>Explain with the help of neat diagram the process of context switching, also explain how program counter plays its role in context switching.</td><td>5</td></tr>
<tr><td>8</td><td>Differentiate between process and thread.</td><td>2</td></tr>
<tr><td>9</td><td>For the table given below, calculate average waiting time and average turnaround time, also draw a Gantt Chart illustrating the process execution using following scheduling algorithms.
i) FCFS ii) SJF (preemptive)
<table>
<tr><th>Process</th><th>Arrival Time</th><th>Burst Time</th></tr>
<tr><td>Pl</td><td>0</td><td>9</td></tr>
<tr><td>P2</td><td>1</td><td>1</td></tr>
<tr><td>P3</td><td>2</td><td>7</td></tr>
<tr><td>P4</td><td>3</td><td>1</td></tr>
<tr><td>P5</td><td>4</td><td>6</td></tr>
</table></td><td>8</td></tr>
<tr><td>10</td><td>Differentiate between user level and kernel level threads.</td><td>5</td></tr>
<tr><td>11</td><td>Explain different types of schedulers in operating system.</td><td>6</td></tr>
<tr><td>12</td><td>For the table given below, calculate average waiting time and average turnaround time and draw a Gantt Chart illustrating the process execution using following scheduling algorithms.
i) Round Robin (time slice - 2 units) ii) Priority (non-preemptive)
<table>
<tr><th>Process</th><th>Arrival Time</th><th>Burst Time</th><th>Priority</th></tr>
<tr><td>P1</td><td>0</td><td>3</td><td>5</td></tr>
<tr><td>P2</td><td>2</td><td>6</td><td>2</td></tr>
<tr><td>P3</td><td>4</td><td>4</td><td>4</td></tr>
<tr><td>P4</td><td>6</td><td>5</td><td>3</td></tr>
<tr><td>P5</td><td>8</td><td>2</td><td>1</td></tr>
</table>
Note: For priority scheduling, minimum value indicates higher priority</td><td>8</td></tr>
<tr><td>13</td><td>Draw and explain process state diagram.</td><td>5</td></tr>
<tr><td>14</td><td>Explain the concept of process control block. Draw the schematic showing all fields of PCB.</td><td>5</td></tr>
<tr><td>15</td><td>Explain the following functions with reference to C
i) pthread_create() ii) pthread_join()</td><td>5</td></tr>
</table>

<table>
<tr><td>16</td><td>For the table given below, calculate average waiting time and average turnaround time and draw a Gantt Chart illustrating the process execution using following scheduling algorithms.
i) SJF (non-preemptive) ii) Priority (Preemptive)
<table><tr><th>Process</th><th>Arrival Time</th><th>Burst Time</th><th>Priority</th></tr><tr><td>P1</td><td>0</td><td>9</td><td>3</td></tr><tr><td>P2</td><td>1</td><td>1</td><td>2</td></tr><tr><td>P3</td><td>2</td><td>7</td><td>1</td></tr><tr><td>P4</td><td>3</td><td>1</td><td>5</td></tr><tr><td>P5</td><td>4</td><td>6</td><td>4</td></tr></table></td><td>8</td></tr>
<tr><td>17</td><td>Enlist and explain different IPC mechanisms.</td><td>6</td></tr>
<tr><td>18</td><td>Discuss the different types of operations on processes.</td><td>5</td></tr>
<tr><td>19</td><td>Discuss the concept of threads and explain its benefits.</td><td>5</td></tr>
<tr><td>20</td><td>Explain in details the steps involved in Unix Process Creation.</td><td>5</td></tr>
<tr><td>21</td><td>Compare FCFS, SJF, RR. State which is better scheduling algorithm.</td><td>6</td></tr>
<tr><td>22</td><td>Explain preemptive and non-preemptive scheduling.</td><td>5</td></tr>
<tr><td>23</td><td>What is the difference between turnaround time and response time?</td><td>4</td></tr>
<tr><td>24</td><td>Discuss the process structure in detail.</td><td>5</td></tr>
<tr><td>25</td><td>How message passing and shared memory is different. Also discuss the advantage and disadvantage of both IPC mechanism.</td><td>8</td></tr>
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