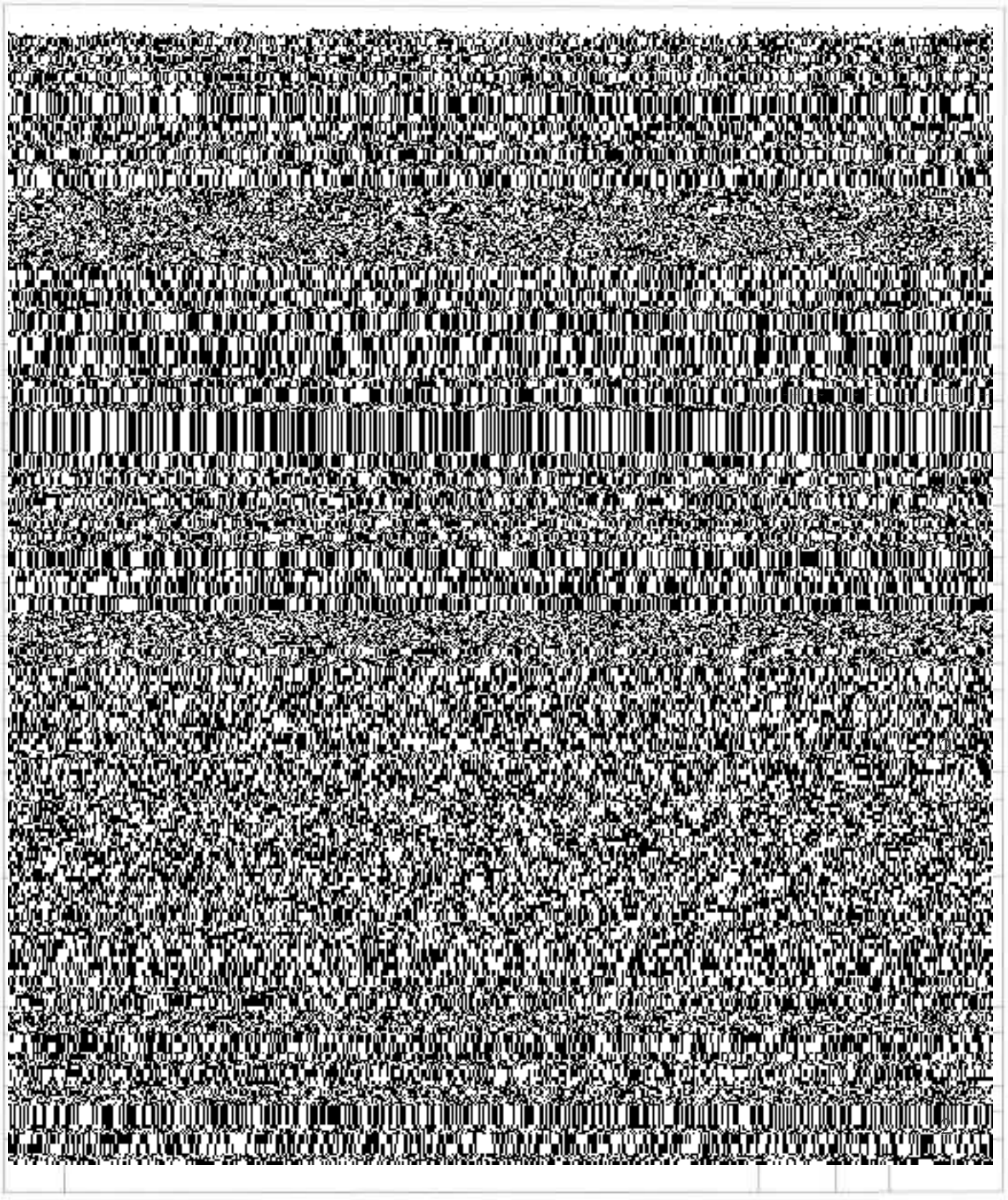

<table>
<tr><td>7</td><td>For the following page reference string 7,0,1,2,0,3,0,4,2,3,0,3,2,1,2,0,1,7,0,1. Calculate the page faults applying the following Page replacement algorithms for a memory with three frames: i) Optimal ii) LRU</td><td>10M</td><td>3</td><td>4</td></tr>
<tr><td rowspan="2">8</td><td>a. Explain about various file access methods with examples.</td><td>5M</td><td>4</td><td>2</td></tr>
<tr><td>b. Define file. Explain the system calls for file operations.</td><td>5M</td><td>4</td><td>2</td></tr>
<tr><td></td><td>OR</td><td></td><td></td><td></td></tr>
<tr><td rowspan="2">9</td><td>a. State and explain directory and disk structure.</td><td>5M</td><td>4</td><td>3</td></tr>
<tr><td>b. Explain file allocation methods in detail.</td><td>5M</td><td>4</td><td>3</td></tr>
<tr><td rowspan="2">10</td><td>a. Describe the system model for deadlocks and explain the four necessary conditions for deadlock.</td><td>5M</td><td>5</td><td>3</td></tr>
<tr><td>b. Discuss about Implementation of Access Matrix in detail?</td><td>5M</td><td>5</td><td>3</td></tr>
<tr><td></td><td>OR</td><td></td><td></td><td></td></tr>
<tr><td>11</td><td>Consider the following snapshot of a system
<table>
<tr><th rowspan="2">Process</th><th colspan="4">Allocation Matrix</th><th colspan="4">Max Matrix</th><th colspan="4">Available Matrix</th></tr>
<tr><th>A</th><th>B</th><th>C</th><th>D</th><th>A</th><th>B</th><th>C</th><th>D</th><th>A</th><th>B</th><th>C</th><th>D</th></tr>
<tr><td>P1</td><td>6</td><td>0</td><td>1</td><td>2</td><td>4</td><td>0</td><td>0</td><td>1</td><td>3</td><td>2</td><td>1</td><td>1</td></tr>
<tr><td>P2</td><td>1</td><td>7</td><td>5</td><td>0</td><td>1</td><td>1</td><td>0</td><td>0</td><td></td><td></td><td></td><td></td></tr>
<tr><td>P3</td><td>1</td><td>6</td><td>5</td><td>3</td><td>3</td><td>0</td><td>6</td><td>3</td><td></td><td></td><td></td><td></td></tr>
<tr><td>P4</td><td>1</td><td>6</td><td>5</td><td>6</td><td>0</td><td>2</td><td>1</td><td>2</td><td></td><td></td><td></td><td></td></tr>
</table>
a) How many resources of type A,B,C, and D are there?
b) What is the content of matrix need?
c) Is the system in a safe state? Why?
d) If a request from process P4 arrives for additional resources of (1, 2, 0, 0) , can the Banker's algorithm grants the request immediately? Show the new system state and other criteria.</td><td>10M</td><td>5</td><td>4</td></tr>
</table>