Answer all the questions from Part A.
1. Why O.S. is called an extended machine?
2. What is a process and how is it modelled?
3. What is meant by race condition?
4. What is relocation and protection?
5. What is swapping?
6. What are the functions of device controllers?
7. What is meant by disk formatting?
8. Explain various file attributes.
9. What are principles of I/O software?
10. Write note on RAID disks. (10x4=40 Marks)

PART - B

Answer one question from each Module.

Module – I

11. a) Explain in detail about O.S. concepts.

   b) Suppose the following processes arrive for execution at the time indicated.

<table>
<thead>
<tr>
<th>Process</th>
<th>Arrival time</th>
<th>Burst time</th>
</tr>
</thead>
<tbody>
<tr>
<td>P₁</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>P₂</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>P₃</td>
<td>5</td>
<td>3</td>
</tr>
</tbody>
</table>

   What is the average turn around time and waiting time for these processes with FCFS and SJF scheduling policies?

   OR
12. a) What is the need of interprocess communication?  
b) Explain the Semaphore implementation of busy waiting.  
c) What are the conditions to create dead-lock in a system?  

Module – II  

13. a) What is virtual memory? How it is implemented?  
b) Explain LRV page replacement algorithm.  
c) What is Belady’s anomaly?  
OR  

14. a) Explain memory management for multiprogramming with fixed portions.  
b) Explain the memory management with bitmap.  
c) Differentiate between external fragmentation and internal fragmentation.  

Module – III  

15. a) Explain any three disk arm scheduling algorithms.  
b) How directories are implemented?  
OR  

16. a) Explain the following:  
1) File structure  2) File types  
3) File attributes  4) File access  
b) Write notes on shared files.