



Figure 1: Processes for Question 1.

- Figure 1 describes three processes P0, P1 and P2, and there are several events that occurred in these processes. Mention the Vector time for all the events in the figure. Explain your answer.
- What is mutual exclusion?
- Briefly discuss (one sentence per topic) each of the centralised, distributed and token ring mutual exclusion techniques under the following topics; fairness, resource use time/efficiency, failure.
- What do we mean by Election Algorithms? Illustrate the workings of the bully algorithm with an illustrative example. Explain the step-by-step procedure in the election of the COORDINATOR.
- Briefly describe what statefull and stateless file services are. List two advantages and disadvantages of each?
- What is a flat file system? Describe the architecture of a flat file system. Write a sentence discussing each of its 3 main components.
- Research the Sun Network File System (NFS) mentioned in lecturers. Write down 3-4 points (bullet point format will suffice) regarding each of the following aspects of the file system:
 - Objective:** What are the design objectives of the file system?
 - Security:** How is access to the file system controlled?
 - Naming:** What resource-naming scheme is used? (You should also show how this affects the various transparencies that are possible in a distributed file system.)

- **The File Access Model:** i.e. Upload/Download v/s Remote Access, etc.
- **Cache Update:** Is caching used in the system? What is the update policy used to achieve caching?
- **Consistency:** How does the NFS ensure file consistency?
- Other relevant information. Please include any other information you deem relevant.

Please check the course book, internet and other resources in addition to the course slides to prepare the answers.