Instructions: Analyze the given concurrency mechanism figures and answer the corresponding questions for each type. Use 3-5 sentences in answering. (6 items x 5 points)

Part I: Counting Semaphore

```
struct semaphore {
        int count;
        queueType queue;
};
void semWait(semaphore s)
{
        s.count--;
        if (s.count < 0) {
          /* place this process in s.queue */;
          /* block this process */;
        }
}
void semSignal(semaphore s)
{
        s.count++;
        if (s.count<= 0) {
          /* remove a process P from s.queue */;
          /* place process P on ready list */;
        }
}
```

Figure 1. A simple program structure of counting semaphore primitives.

Questions:

1. In your perspective, what makes counting semaphore primitives a good concurrency mechanism?
2. How does the structure of counting semaphore primitives differ from binary semaphore primitives?

Part II: Binary Semaphore

```
struct binary_semaphore {
        enum {zero, one} value;
        queueType queue;
};
 void semWaitB(binary_semaphore s)
{
        if (s.value == one)
            s.value = zero;
        else {
                    /* place this process in s.queue */;
                    /* block this process */;
        }
}
 void semSignalB(semaphore s)
{
        if (s.queue is empty())
            s.value = one;
        else {
                    /* remove a process P from s.queue */;
                    /* place process P on ready list */;
        }
}
```

Figure 2. A simple program structure of binary semaphore primitives.

Questions:

3. Briefly explain the purpose of the **semWaitB** and **semSignalB** functions in Figure 2.
4. Based on Figures 1 and 2, which semaphore structure is easier to implement and why?

Part III: Monitor

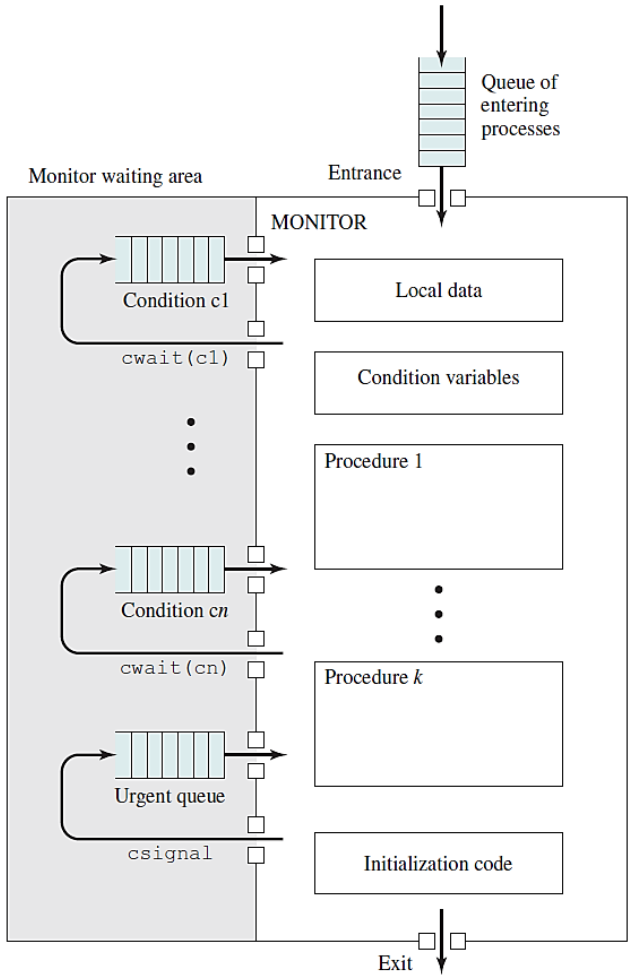

Figure 3. The structure of a monitor relative to concurrency.

Questions:

5. Deduce at least one (1) characteristic of a monitor based on Figure 3. Elaborate on your answer.
6. Would you agree that a monitor, as a concurrency mechanism, can support process synchronization? Why or why not?

Grading Rubric:

Criteria	Performance Indicator	Points
Content	Correct ideas, concepts, and/or examples were included.	3
Organization	The presentation of idea was generally organized.	2
	TOTAL	**5**

Note: *DO NOT COPY AND PASTE. Students who copy and paste their work from any website or their classmate will automatically receive a failing mark for this activity.*