

1. True or False. [5 marks]

- 1) False
- 2) False
- 3) True
- 4) False
- 5) False

2. Multiple-Choice Questions: Choose the answer that best applies. [10 marks]

- 1) D) All of the above
- 2) C) Short-term scheduler
- 3) B) determines what will be done
- 4) B) file descriptor 0
- 5) B) 9
- 6) B) <
- 7) A) appropriately defining the various layers
- 8) C) They cannot be attempted from user mode.
- 9) D) Throughput
- 10) C) FCFS

3. Fill in the appropriate word, phrase or value in the space provided [0.5 mark each unless otherwise specified in the question (at the end of the question), 5 marks]

- 1) Shortest-Job-First
- 2) new, running, waiting, ready, and terminated
- 3) shared memory, message passing
- 4) cache coherency (**1 mark**)

Short Answer Questions

4. What is Zombie process? (2 marks)

A process that has completed execution (or is terminated) [**1 mark**] but still has an entry in the process table (or the exit status has not been read or collected by its parent) [**1 mark**]

5. What are advantages and disadvantages of a larger quantum size in Round-Robin scheduling? (2 marks)

Advantage: It avoid unnecessarily frequent context switch. [**1 mark**]

Disadvantage: The O/S would become less responsive, which prevents it from being effective in time sharing systems. [1 mark]

6. Explain the difference between concurrency and parallelism. (2 marks)

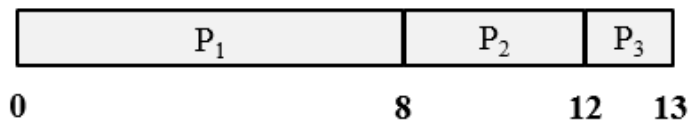
Parallelism implies a system can perform more than one task simultaneously [1 mark], specifically, parallelism on a multi-core system

Concurrency supports more than one task making progress [1 mark], specifically, concurrent execution on single-core system

7.

<u>Process</u>	<u>Arrival Time</u>	<u>Burst Time</u>
P_1	0.0	8
P_2	0.4	4
P_3	1.0	1

a) What is the average waiting time for these processes with the FCFS scheduling algorithm? (3 marks)

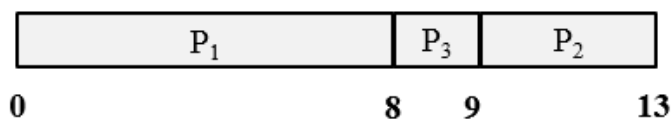


[1 mark]

Waiting time for $P_1 = 0$; $P_2 = 7.6$; $P_3 = 11$ [1 mark]

Average waiting time: $(0 + 7.6 + 11)/3 = 6.2$ [1 mark]

b) What is the average waiting time for these processes with the SJF scheduling algorithm? (3 marks)



[1 mark]

Waiting time for $P_1 = 0$; $P_2 = 8.6$; $P_3 = 7$ [1 mark]

Average waiting time: $(0 + 8.6 + 7)/3 = 5.2$ [1 mark]