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NAME:- KRUNAL RANK

ROLL NO:- U18C0081

CLASS:- BTECH III, Computer Eng.

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U18CO081 KRUNAL RANIC · K.R.R.

Operating System
Test

Ans 1:- Some of the criteria that are necessary to evaluate CPU scheduling algorithms are as follows:-

- CPU utilization:- A scheduling algorithm should be designed so that the CPU remains busy as possible.
- Throughput:- Throughput is the amount of work completed in a unit of time. The scheduling algorithm must maximize the number of job processes per unit time to increase the throughput.
- Response time:- Response time is the time when CPU starts responding to the request. It should be minimized.
- Turn around time:- It is the time when job is completed after it was assigned. It should be minimized.
- Waiting time:- It is the time for which the process has to wait in the queue. It needs to be reduced as well.
- Fairness:- The CPU scheduling algorithm must assign each process a fair share of the CPU.

Ans 2:- Convoy Effect is phenomenon associated with the First Come First Serve (FCFS) algorithm.

- It is the phenomenon when large processes are served before short burst time processes due to which the average waiting time is increased.

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For example, consider a queue for billing items in a mall.
If a trolley with many items ~~are~~ is processed first, then the trollies with one or two items behind it will have to wait for longer duration.

Large processes. Short processes.

Ans 3:- The four necessary conditions for deadlock are as follows:-

- Mutual Exclusion:- When a philosopher picks up one chopstick, it cannot be shared with others.
- Hold and Wait:- When the philosopher tries to pick up a chopstick, he only picks up one at a time.
- No preemption:- Once a philosopher picks up a chopstick, it cannot be taken away from him.
- Circular Wait:- Because all of the philosophers are sitting in a round table and each philosopher has access to the chopstick next to them, they affect the choices of other philosopher.

This situation can be fixed if two philosophers chopsticks that are not affected by their choices pick up the chopsticks and continue with the food. This goes on and deadlock will cease to exist.

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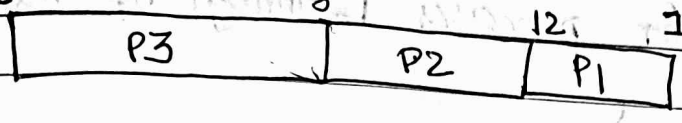
Ans 4.a) Gantt chart ~~for~~ for the given case will be as follows:-



b) Turn Around Times:-

P1 = 14

P2 = 12

P3 = 8

Average = $\frac{14+12+8}{3} = \frac{34}{3}$ units

Waiting Times:-

P1 = 12

P2 = 8

P3 = 0

Average = $\frac{12+8+0}{3} = \frac{20}{3}$ units

Response Time:-

P1 = 12

P2 = 8

P3 = 0

Average = $\frac{12+8+0}{3} = \frac{20}{3}$ units

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Ans 5:

a) The values of Need for processes P_0 through P_4 respectively are :-

(0,0,0,0)
(0,7,5,0)
(1,0,0,2)
(0,0,2,0)
(0,6,4,2)

b) Yes with the available equal to (1,5,2,0) either process P_0 or P_3 could run.
Once, P_3 runs, it releases its resources, which allow all other existing processes to run.

c) The request can be granted immediately in the order of finish P_0, P_2, P_3, P_1 and P_4.