Theory

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Question 1: (5 points): Consider a system with 5 jobs in the ready-queue with service-time requirements as shown with their order in the queue as (20, 10, 5, 15, 30). The job with the service time requirement of 20 is at the head of the queue. What will be the average waiting-time and average turnaround time when FCFS scheduling is used?

Averaging waiting time: 27
Averaging turnaround time: 43

See figure below.

Question 2: (5 points): For the above problem, what will the values for these two measures when round-robin scheduling with service quantum value of 5 is used?

Averaging waiting time: 34
Averaging turnaround time: 50

See figure below.

Question 3: (5 points): For the same problem, now consider the Shortest Job First scheduling and determine the values for these two measures.

Averaging waiting time: 20
Averaging turnaround time: 36

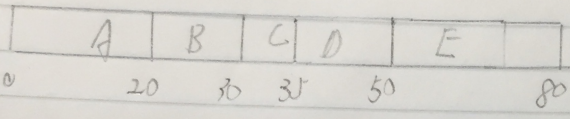
See figure below.

Question 4: (5 points): In a system, five jobs are waiting for execution. Their required service times are (9, 6, 3, 5, and X). In what order should they be executed to minimize the average turnaround time? Your answer will depend on the value of X.
For X, 3, 5, 6, 9 order: $0 < X <= 3$
For 3, X, 5, 6, 9 order: $3 < X <= 5$
For 3, 5, X, 6, 9 order: $5 < X <= 6$
For 3, 5, 6, X, 9 order: $6 < X <= 9$
For 3, 5, 6, 9, X order: $9 < X$

A 20 15 10 5
B 10 5
C 5
D 15 10 5
E 30 25 20 15

(20 + 10 + 5 + 15 + 30) ÷ 5 = 16

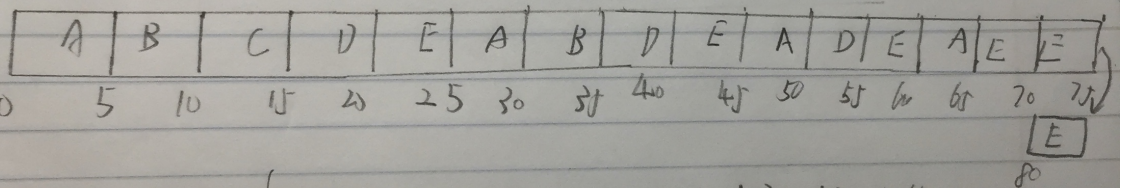
1 FCFS



Averaging waiting time: (20 + 30 + 35 + 50) / 5 = 27

Averaging turnaround time: 27 + 16 = 43

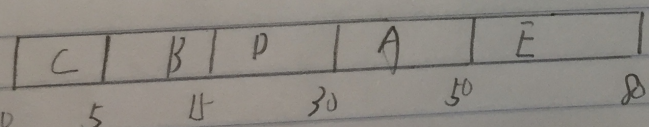
2.



Waiting time: (0 + 5 + 10 + 15 + 20 + 20 + 20 + 15 + 15 + 15 + 10 + 10 + 10 + 5) ÷ 5
= 34

turnaround time: 34 + 16 = 50

3.



Waiting time: (0 + 5 + 15 + 30 + 50) ÷ 5 = 20

turning around time: 20 + 16 = 36