

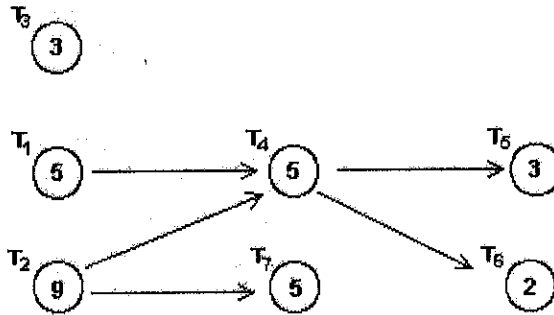
Name: _____

Date: _____

Scheduling Review

1. What is the minimum time required to complete 10 independent tasks on 3 processors when the sum of all the times of the 10 tasks is 60 minutes?

2. Given the order-requirement digraph (with time given in minutes) and the priority list $T_1, T_2, T_3, T_4, T_5, T_6, T_7$ apply the **list-processing algorithm** to construct a schedule using:



- a. Two processors. What is the completion time?

- b. On three processors. What is the completion time?

Critical Path Algorithm

3. The following table consists of the eight tasks needed to complete a certain project.

Task	Processing Time	Tasks that must be completed before the task can start
A	3	
B	10	C, F, G
C	2	A
D	4	G
E	5	C
F	8	A, H
G	7	H
H	5	

- a. Draw a project digraph for this scheduling problem.
- b. Schedule the project with 3 processors using the critical path algorithm. Show the timeline and give the finishing time.
- c. Schedule the project with 2 processors using the critical path algorithm. Show the timeline and give the finishing time.

4. The following table consists of the eight tasks needed to complete a certain project.

Task	Length of Task	Tasks that must be completed before the task can start
A	5	C
B	5	C, D
C	5	
D	2	G
E	15	A, B
F	6	D
G	2	
H	2	G

- a. Draw a project digraph for this scheduling problem.
- b. Schedule the project with 3 processors using the critical path algorithm. Show the timeline and give the finishing time.
- c. Schedule the project with 2 processors using the critical path algorithm. Show the timeline and give the finishing time.

List-Processing and Decreasing-Time Algorithms

5. Apartments Unlimited is an apartment maintenance company that refurbishes apartments before new tenants move in. The following table shows the tasks performed when refurbishing a one-bedroom apartment, the processing time required for each task (measured in 15-minute units), and the precedence relations between tasks.

Tasks	Symbol/time	Precedence Relations
Bathrooms (clean)	B(8)	$P \rightarrow B$
Carpets (shampoo)	C(4)	$S \rightarrow C, W \rightarrow C$
Filters (replace)	F(1)	
General cleaning	G(8)	$B \rightarrow G, F \rightarrow G, K \rightarrow G$
Kitchen (clean)	K(12)	$P \rightarrow K$
Fix Lighting	L(1)	
Paint	P(32)	$L \rightarrow P$
Smoke detectors	S(1)	$G \rightarrow S$
Windows (wash)	W(4)	$G \rightarrow W$

- a. Draw a project digraph for refurbishing a one-bedroom apartment.

- b. Using the Priority List B, C, F, G, K, L, P, S, W, create a schedule for refurbishing an apartment with two workers. Show the project timeline and give its finishing time.

- c. Using the Priority List W, C, G, S, K, B, L, P, F, create a schedule for refurbishing an apartment with two workers. Show the project timeline and give its finishing time.

- d. Using the decreasing-time algorithm, schedule the project with 3 workers. Show the timeline for the project and give the finishing time.

- e. Using the decreasing-time algorithm, schedule the project with 4 workers. Show the timeline for the project and give the finishing time.