Operating Systems: Scheduling Quiz

A printing company receives and prints items. It has one large industrial printer.

High priority is lower number. Therefore Priority 1 is highest priority, and Priority 2 is high priority and so forth. Assume that when a print job arrives, it can be worked on the same day. E.g. If Thesis comes on Monday, we can do 1 day of printing for Thesis that same Monday. Even though 2 jobs appear on the same day, you can assume one called before the other based on the order in which they appear in the list. E.g. Evaluation is on row 2, and Email is on row 3, this means that even though they are both same day, Evaluations came before Emails.

Printing Name	Arrival Time	Print Time	Priority
Thesis (T)	Monday	2 days	3
Evaluations (E)	Tuesday	5 days	2
Emails (M)	Tuesday	2 days	4
Exams (X)	Wednesday	4 days	1

Determine (i) response time (ii) average waiting time and (iii) average turn-around time for the following schedules

- a) First Come First Served (FCFS) (3 Points)
- b) Shortest Job First (SJF) no preemption (3 Points)
- c) Round Robin (RR) using 1 day per round (i.e. after 1 day, we switch jobs if necessary) (3 Points)
- d) Priority Scheduling with preemption (3 Points)

If we buy a 2<sup>nd</sup> printer that allows us to run 2 jobs at the same time, determine (i) response time (ii) average waiting time for the following schedules:

- e) First Come First Served (FCFS) (3 Points)
- f) Shortest Job First (SJF) no preemption (3 Points)

Please show graph or chart indicating when the different print jobs were run. You can fill in the chart with T,E,M,X per the process as in example below. I am using \_ (underscore) for waiting.

If you decide to work by pen-and-paper, just print or use this first page. The questions are all here.

	Arrival	Time															
			Mon	Tue	Wed	Thur	Fri	Sat	Sun	Mon	Tue	Wed	Thur	Fri	Sat	Sun	Mon
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Thesis (T)	Mon	2 days	Т	Т													
Evaluations (E)	Tue	5 days		ı	Ε	ı	1										
Emails (M)	Tue	2 days		ı	_	Μ	Μ										
Exams (X)	Wed	4 days			_	-	-										

# a) First Come First Served (FCFS) (3 Points)

	Arrival	Time	Mon	Tue	Wed	Thur	Fri	Sat	Sun	Mon	Tue	Wed	Thur	Fri	Sat	Sun	Mon
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Thesis (T)	Mon	2 days															
Evaluations (E)	Tue	5 days															
Emails (M)	Tue	2 days															
Exams (X)	Wed	4 days															

### b) Shortest Job First (SJF) no preemption (3 Points)

	Arrival	Time	Mon	Tue	Wed	Thur	Fri	Sat	Sun	Mon	Tue	Wed	Thur	Fri	Sat	Sun	Mon
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Thesis (T)	Mon	2 days															
Evaluations (E)	Tue	5 days															
Emails (M)	Tue	2 days															
Exams (X)	Wed	4 days															

# c) Round Robin (RR) using 1 day per round (i.e. after 1 day, we switch jobs if necessary) (3 Points)

	Arrival	Time	_														
			Mon	Tue	Wed	Thur	Fri	Sat	Sun	Mon	Tue	Wed	Thur	Fri	Sat	Sun	Mon
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Thesis (T)	Mon	2 days															
Evaluations (E)	Tue	5 days															
Emails (M)	Tue	2 days															_
Exams (X)	Wed	4 days															_

## d) Priority Scheduling with preemption (3 Points)

	Arrival	Time															
			Mon	Tue	Wed	Thur	Fri	Sat	Sun	Mon	Tue	Wed	Thur	Fri	Sat	Sun	Mon
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Thesis (T)	Mon	2 days															
Evaluations (E)	Tue	5 days															
Emails (M)	Tue	2 days															
Exams (X)	Wed	4 days															

# e) First Come First Served (FCFS) (3 Points)

	Arrival	Time	Mon	Tue	Wed	Thur	Fri	Sat	Sun	Mon	Tue	Wed	Thur	Fri	Sat	Sun	Mon
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Thesis (T)	Mon	2 days															
Evaluations (E)	Tue	5 days															
Emails (M)	Tue	2 days															
Exams (X)	Wed	4 days															

## f) Shortest Job First (SJF) no preemption (3 Points)

	Arrival	Time	Mon	Tue	Wed	Thur	Fri	Sat	Sun	Mon	Tue	Wed	Thur	Fri	Sat	Sun	Mon
			2	-	>	-	ш	S	S	2	<b>—</b>	>	<b>—</b>	ш	S	S	2
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Thesis (T)	Mon	2 days															
Evaluations (E)	Tue	5 days															
Emails (M)	Tue	2 days															
Exams (X)	Wed	4 days															