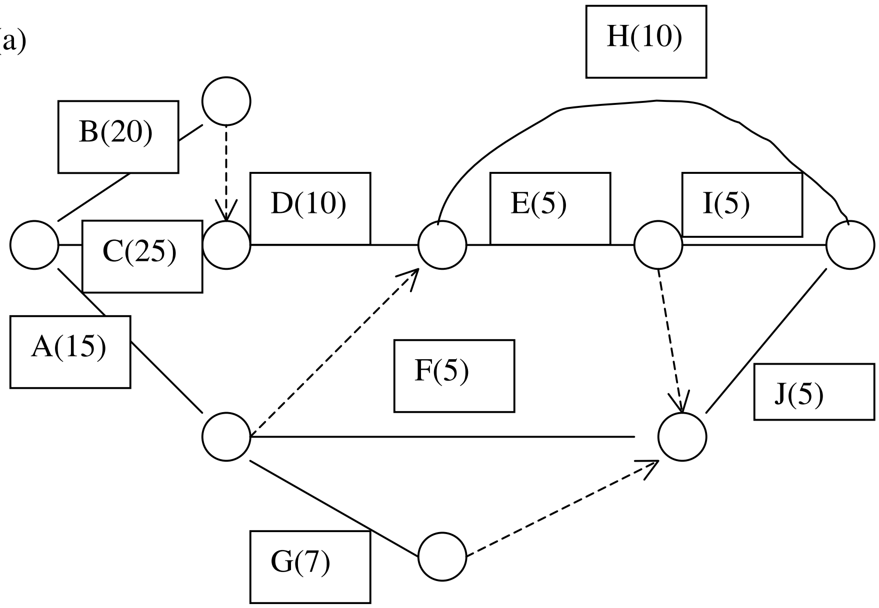
BRIEF SOLUTIONS FOR PRACTICE FINAL

1(a)



Critical paths are C-D-E-I or C-D-H or C-D-E-J (45 minutes)

(b) variance = 0.4*mean, so variance = .4(45) = 18; std dev = 4.24

P{takes more than 60 minutes} = P{z> (60-45)/4.24} = P{z > 3.54} = almost zero

(c) total time = 107 minutes
107/4 = 26.75 mins/station but almost all processing times are multiples of 5 so let's try C = 30.

Feasible assembly line balance:

Stn 1	Stn 2	Stn 3	Stn 4
C 25	B 20	A 15	F 5
	D 10	E 5	G 7
		H 10	I 5
			J 5

Assigning mom to the last station (with only 22 minutes of work) will keep her happy.

2(a) Extension of Johnson's rule to 3 machines applies. Notice that the processing times on machine B for jobs 5 and 6 are zero.

Job	t1'	t2'
1	13	8
2	3	7
3	7	4
4	11	9
5	1	1
6	8	3

Job 5 can go first or last in the sequence. Optimal sequences are:

5—2—4—1—3—6 or
2—4—1—3—6—5

(b) We would like to minimize the makespan considering only machines A and B, because that is when the operator of machine B can go home. Optimal sequences are:

4—1—3—2 or
1—4—3—2

(c) A reasonable sequence would be an EDD sequence, breaking ties by SPT. This policy recognizes due dates, but if two or more jobs have the same due date, the shorter ones will go first, which minimizes the flow time of the jobs with the same due date.

The final sequence would be 1 – 5 – 4 – (2 or 3) - (3 or 2) - 6. All jobs are on time in this schedule.

3. Only a few answers are provided here.

Midwest Stamping: G (product cycling model)
Lawn King: J (aggregate planning); maybe also I (Winters' model)