1. A
2. C
3. B
4. B
5. E
6. D
7. C
8. A
9. C
10. B

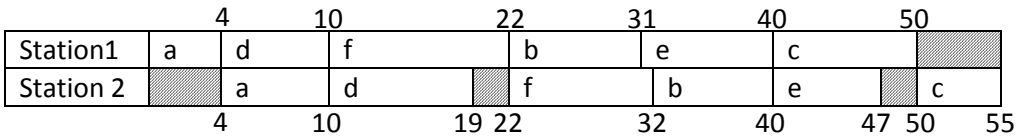
11.

a) $EOQ = \sqrt{\frac{2DS}{H}} = \sqrt{\frac{2(120)(3)}{0.3}} = 48.99 \approx 50\ boxes$

b) $TC = \frac{Q}{2}H + \frac{D}{Q}S = \frac{49}{2}(0.3) + \frac{120}{49}(3) = 7.35 + 7.35 = \$14.70$

c) $Average\ Inventory = \frac{Q}{2} = \frac{49}{2} = 24.5\ boxes$

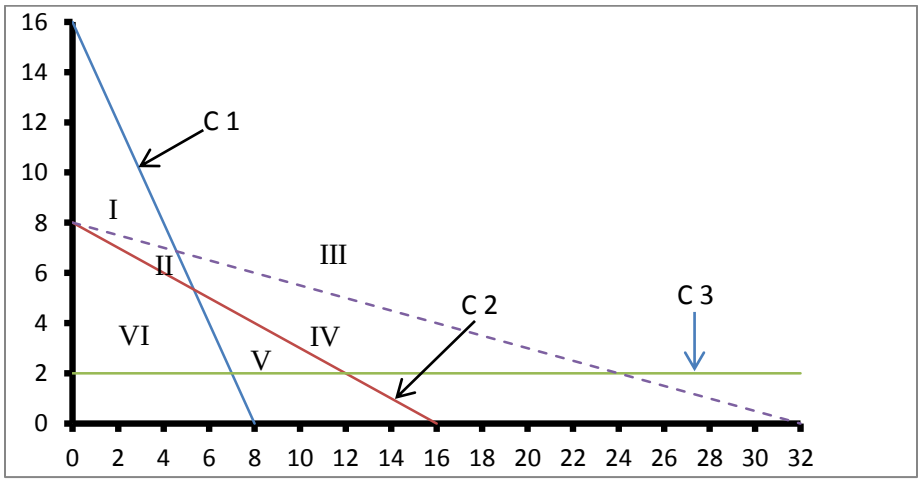
12. Sequence of jobs: a-d-f-b-e-c



Total completion time (Makespan) = 55 days (1 point)
Total idle time = 4 + 3 + 3 = 5 = 15 days (1 point)

13.

a)



b) both III and IV

c) (1 point each)

x: 12	y: 2	Z: 40

14.

Quantity	Unit price	H (8% of unit price)
1 - 39	$14	1.12
- 59	13	1.04
- 89	12	.96
90+	11	.88

First, calculate the EOQ for all the quantity ranges until the EOQ is feasible starting from the lowest price.

$EOQ_{11} = \sqrt{\frac{2DS}{H}} = \sqrt{\frac{2(120)(8)}{0.88}} = 46.71 \approx 47$ (not feasible for quantity range 90+)

$EOQ_{12} = \sqrt{\frac{2DS}{H}} = \sqrt{\frac{2(120)(8)}{0.96}} = 44.72 \approx 45$ (this is also not feasible for quantity range 60-89)

$EOQ_{13} = \sqrt{\frac{2DS}{H}} = \sqrt{\frac{2(120)(8)}{1.04}} = 42.97 \approx 43$ (this is feasible for quantity range 40-59)

So, we don't need to calculate further. Now we will compare the TC for EOQ at 43 units and at 90 units to find out the minimum TC:

$TC_{min} = \frac{Q_{opt.}}{2}H + \frac{D}{Q_{opt.}}S + RD$

$TC_{42.97} = \frac{42.97}{2}(1.04) + \frac{120}{42.97}(8) + (13)(120) = \$22.35 + \$22.35 + \$1560 = \$1604.70$

$TC_{90} = \frac{90}{2}(0.88) + \frac{120}{90}(8) + (11)(120) = \$39.60 + \$10.67 + \$1320 = \$1370.27$

Since the TC @ 90 units is the lower than the TC @ 43 units, it is better to order 90 units .

15.

i. SPT: D-C-A-E-B, EDD and MST: C-B-E-D-A

SPT:

[1] Job	[2] Processing Time (days)	[3] Flow Time	[4 Day Due	[3] – [4] Days Late
D	2	2	8	0
C	3	5	1	4
A	4	9	11	0
E	5	14	7	7
B	6	20	5	15
		50		26

ii. **EDD and MST:**

[1] Job	[2] Processing Time (days)	[3] Flow Time	[4] Day Due	[4] – [2] Slack Time	[3] – [4] Days Late
C	3	3	1	-2	2
B	6	9	5	-1	4
E	5	14	7	2	7
D	2	16	8	6	8
A	4	20	11	7	9
		62			30

	SPT	**EDD and MST**
$average\ flow\ time\ = \frac{total\ flow\ time}{\#\ of\ jobs}$	$\frac{50}{5} = 10$	$\frac{62}{5} = 12.4$
$average\ job\ lateness = \frac{total\ lateness}{\#\ of\ jobs}$	$\frac{26}{5} = 5.2$	$\frac{30}{5} = 6$
$average\ WIP = \frac{total\ flow\ time}{makespan}$	$\frac{50}{20} = 2.5$	$\frac{62}{20} = 3.1$