

國立臺灣科技大學 104 學年度碩士班招生試題

系所組別：工業管理系碩士班乙組

科目：生產管理

(總分為 100 分)

1. The manager of a carpet store is trying to determine optimal installation crew size. He has tried various crew sizes with the results shown below. Compute the average labor productivity for each crew size. (15%)

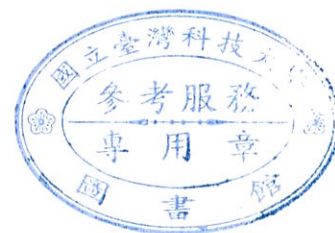
Crew Size	Yards Installed
2	706
4	1308
3	1017
3	1002
4	1288
2	692

2. Develop a forecast for the next period, given the data below, using a 3 period moving average. (15%)

Period	Demand
1	19
2	20
3	18
4	19
5	17

3. A component of a research instrument has a probability of .98 operating. It has a backup component that has a probability of .95 of operating. The instrument will function if either component operates. Determine the overall reliability of this subsystem under these conditions:

- A. The backup and the main components are connected by a switch which is certain to function should the main component failed. (10%)
- B. The switch to the backup has a probability of .99 operating. (10%)



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4. The following tables contain sequence-dependent setup time for three types of jobs, A, B, and C.

A. Determine the processing sequence that will minimize the makespan. (10%)

B. Determine the processing sequence that will minimize the tardiness. (10%)

Job workload

	Processing time	Due date
A1	1	7
A2	2	6
A3	3	41
A4	4	4
A5	5	30
A6	8	38
B1	1	24
B2	2	23
B3	3	21
C1	1	11
C2	2	16
C3	3	14

Setup time matrix

following Preceding	A	B	C
A	0	2	3
B	1	0	4
C	1	2	0

5. The assumptions of the Economic Production Quantity (EPQ) are similar to those of the EOQ model, except that instead of orders received in a single delivery, units are received incrementally during production. Given the holding cost per unit per year H , the unit set-up cost S , the production rate p , the usage rate $0.5p$, and the annual demand D , derive the cycle time, run time, the maximum and average inventory levels, the total cost function, and the optimal EPQ to minimize cost. (15%)

6. 何謂長鞭效應？發生長鞭效應的原因有那些？請詳述。而時尚流行新品上市，常常發生缺貨，試由長鞭效應角度仔細分析其原因。(15%)

