

國立高雄應用科技大學
九十七學年度碩士班招生考試
工業工程與管理系（甲組）

准考證號碼 （考生必須填寫）

生產管理

試題 共 3 頁，第 1 頁

注意：a. 本試題共五大題，共 100 分。

b. 作答時不必抄題，但須依題號之順序作答，且題號應標示清楚。

c. 考生作答前請詳閱答案卷之考生注意事項。

1. Explain the following terminologies with brevity and clarity. (30%)

(1). Mass customization

(2). Cellular production

(3). Microfactory

(4). DMAIC

(5). Cross-docking

(6). Type II error

2. (20%)

The following table shows orders to be processed at a machine shop as of 8:00 a.m. Monday. The jobs have different operations they must go through. Processing times are in days. Jobs are listed in order of arrival.

a. Determine the processing sequence at the first work center using each of these rules: (1) FCFS, (2) S/O.

b. Compute the effectiveness of each rule using each of these measures: (1) average completion time, (2) average number of jobs at the work center.

Job	Processing Time (days)	Due Date (days)	Remaining Number of Operations
A	8	20	2
B	10	18	4
C	5	25	5
D	11	17	3
E	9	35	4

3. (20%)

A small building contractor has recently experienced two successive years in which work opportunities exceeded the firm's capacity. The contractor must now make a decision on capacity for next year. Estimated profits under each of the two possible states of nature are as shown in the table below. Which alternative should be selected if the decision criterion is

- a. Maximax?
- b. Maximin?
- c. Laplace?

Alternative	NEXT YEAR'S DEMAND	
	Low	High
Do nothing	\$50*	\$60
Expand	20	80
Subcontract	40	70

*Profit in \$ thousands.

4. (10%)

How many observations should a time study analyst plan for in an operation that has a standard deviation of 1.5 minutes per piece if the goal is to estimate the mean time per piece to within 0.4 minute with a confidence of 95.5 percent?

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5. (20%)

A manager must decide which type of machine to buy, A, B, or C. Machine costs are as follows:

<u>Machine</u>	<u>Cost</u>
A	\$40,000
B	\$30,000
C	\$80,000

Product forecasts and processing times on the machines are as follows:

<u>Product</u>	<u>Annual Demand</u>	<u>PROCESSING TIME PER UNIT (MINUTES)</u>		
		<u>A</u>	<u>B</u>	<u>C</u>
1	16,000	3	4	2
2	12,000	4	4	3
3	6,000	5	6	4
4	30,000	2	2	1

- Assume that only purchasing costs are being considered. Which machine would have the lowest total cost, and how many of that machine would be needed? Machines operate 10 hours a day, 250 days a year.
- Consider this additional information: The machines differ in terms of hourly operating costs: The A machines have an hourly operating cost of \$10 each, B machines have an hourly operating cost of \$11 each, and C machines have an hourly operating cost of \$12 each. Which alternative would be selected, and how many machines, in order to minimize total cost while satisfying capacity processing requirements?