

國立臺灣科技大學

114學年度碩士班招生

試題

系所組別：0120工業管理系碩士班乙組

科 目：生產管理

<<501203>>



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(總分為 100 分；所有試題務必於答案卷內頁依序作答)

1..(15%) For a factory, assume 40-hour weeks and an hourly wage of \$20. Overhead is 3.5 times weekly labor cost. Material cost is \$6 per pound.

Week	Output	Number of Workers	Material (lbs.)
1	30,000	8	450
2	50,000	7	500
3	40,000	7	460
4	35,400	10	700

1.1 (7%) Calculate the multifactor productivity (MFP) for each week.

1.2 (8%) For the week with the worst MFP, determine the minimum reduction in the number of workers required to achieve the best MFP value.

2. (15%) The number of complaints for a company in each season is shown as:

Period	Number of Complaints
2024, Spring	60
2024, Summer	65
2024, Autumn	55
2024, Winter	58
2025 Spring	64
2025 Summer	30
2025 Autumn	50

2.1 (7%) Generate a forecast for the winter of 2025 using the Exponential Smoothing method with a smoothing constant of 0.4.

2.2 (8%) Calculate the seasonal relatives for each season (including winter 2025) using the Simple Average (SA) method, rounding the seasonal averages to three decimal places and the seasonal relatives to two decimal places.

3. (20%) Multiple choice questions (單選題)

3.1 (5%) Which of the following is not an approach for decision making under uncertainty?

- A. Decision tree
- B. Maxmin



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- C. Maxmax
- D. Minimax regret
- E Laplace

3.2 (5%) A common goal in design process layout is

- A. Minimizing the number of workers
- B. Minimizing idle time
- C. Minimizing transportation cost
- D. Maximizing work-station production time

3.3 (5%) In location planning, environmental regulations, availability of utilities, and direct and indirect taxes are

- A. Regional factors
- B. Community factors
- C. Site related factors
- D. National factors

3.4 (5%) Which of the following is not a key external factor which should be taken into account by a corporate strategy

- A. Economic conditions
- B. Political conditions
- C. Legal conditions
- D. Financial resources

4 (20 %) Create a detailed quarterly sales forecast for the next year. Develop your forecasting approach and explain the reasoning behind your chosen method.

quarter	Product Demand
1	40
2	38
3	41
4	46
5	42
6	41
7	43
8	47
9	43



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10	41
11	43
12	49
13	43
14	42

5.(20 %) A manufacturing plant produces components at a maximum rate of 5,000 units per day, which are supplied to customers at a steady rate of 250 units daily. Each time the production equipment needs to be set up, it costs \$66. Storing these components costs 45 cents per unit annually, and the plant operates for 300 days each year. What is the optimal number of components that should be produced in each run? Additionally, determine how many production runs should be scheduled per year and how long each production run should last in days.

6. (10%) Please explain how Group Technology can be implemented in manufacturing service industries with AIoT capabilities.

