

國立臺北科技大學 101 學年度碩士班招生考試

系所組別：4110 工業工程與管理系碩士班甲組

第二節 生產管理 試題

第一頁 共二頁

注意事項：

1. 本試題共 13 題，配分共 100 分。
2. 請標明大題、子題編號作答，不必抄題。
3. 全部答案均須在答案卷之答案欄內作答，否則不予計分。

Part A · Multiple Choice Questions (10 questions, 20 points)

This part of the exam contains ten multiple choice questions with two points allotted for each question. For each question, please select the "best" choice among a set of four options.

[Note: Please copy your answer for questions in this part in a table format as follows.]

Question #	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10
Answer										

- A1. Under which of the following scenario is a firm to be considered efficient?
- a) When it is producing its product or service at the lowest possible average cost.
 - b) When it is fully utilizing its capacity.
 - c) When it has minimized the amount of waste that it produces.
 - d) When it employs the maximum number of workers.
- A2. The terminology of "capacity" specifies:
- a) Doing things in the right proportion
 - b) Variety or level of customization that can be achieved
 - c) Maximum rate of production that is attainable
 - d) Output per unit of input
- A3. A ___ should be used to produce partially standardized outputs in small to medium volume.
- a) Continuous transformation process
 - b) Flow shop
 - c) Job shop
 - d) Cellular production

A4. DMAIC stands for:

- a) Define, Measure, Analyze, Improve, Control
- b) Define, Maintain, Assure, Implement, Control
- c) Define, Measure, Analyze, Implement, Control
- d) Design, Maintain, Analyze, Improve, Control

A5. Assume that Company X produces a variety of cell-phones sequentially on 3 machines.

The times required on each machine for one typical racket are as follows: M1: 3 minutes M2: 8 minutes, M3: 2 minutes. The shortest possible cycle time for a cell-phone is :

- a) 13 minutes
- b) 8 minutes
- c) 2 minutes
- d) none of the above

A6. The _____ plan is a preliminary, approximate schedule of an organization's overall operations that will satisfy the demand forecast at minimum cost.

- a) Production
- b) Rough-cut capacity
- c) Aggregate
- d) Efficiency

A7. Which of the following is conducted when checking feasibility of the master schedule?

- a) Capacity planning
- b) Rough-cut capacity planning
- c) Priority planning
- d) Detailed scheduling

A8. Which of the following statements about Supply Chain Management (SCM) is correct?

- a) SCM is putting ever greater emphasis on the marketing function.
- b) SCM coordinates and integrates several activities into a process and links a few of the partners in the chain.
- c) SCM enables manufacturers to actively plan and collaborate across a distributed supply chain.
- d) The goal of SCM is to deliver a good product at the right time, simultaneously sub-optimizing profits.

A9. All of the following are justifications for holding large stocks of raw materials, except

- a) large quantities are available on the market.
- b) in anticipation of a future shortage and rapid rise in price.
- c) the seasonal supply of materials such as coffee beans or even garden peas.
- d) to take advantage of significant bulk buying reductions.

注意：背面尚有試題

A10. The terminology of “opportunity cost” to a business of an investment is

- a) the cost of all the fixed assets that are to be purchased.
- b) the amount of capital that has to be borrowed to be able to make the investment.
- c) the amount by which the project will have risen due to inflation, on a monthly basis.
- d) the next best investment now foregone.

Part B · Short Answers and Mathematical Questions (3 questions, 80 points)

This part of the exam contains three questions either require short answer or calculation. For math questions, please show all your work step by step in the solution area.

Question B1. (25 points)

Next Generation Foundries has started production of its new microchip. The first phase in this production is the wafer fabrication process. Because the difficulty in fabricating acceptable wafers has been great, the objective in management is to continually improve the process to increase its *production yield* (the percentage of wafer fabricated in the current lot that are of acceptable quality for producing microchips). So far the production yields of the previous 5 lots have been 15%, 21%, 24%, 32%, and 37%. Please round all your calculation to the first digit after decimal. Use exponential smoothing with trend to forecast the production yield of the next 3 lots (lot number 6, 7, and 8). Assume that the initial estimate of 10% for the average (a_0) and 5% for the trend (b_0), and use smoothing parameters of $\alpha=0.2$ and $\beta=0.2$.

Question B2. (25 points)

Solve the following two-machine flow shop problem with 6 jobs. Each job must be processed on two machines, namely machine A and machine B, with the processing times (in minutes) as follows.

Job	1	2	3	4	5	6
Machine A	10	2	4	8	5	12
Machine B	2	4	5	8	6	9

Please find the optimal schedule that has the minimal makespan and construct the Gantt chart for the schedule.

Question B3. (30 points)

A large producer of household appliances purchases control motors for one of its product from a supplier outside of the company. The quantity of control motors needed is at a fairly steady rate of 100 per month, and the cost of holding any raw material for a year is 10% of the purchase value.

- (1) Assume that the cost of processing an order is \$2000, the current offer from the supplier with all-units discount as follows.

Order Quantity	Unit Price (\$)
$0 \leq Q < 2200$	12
$2200 \leq Q$	10

Please find the optimal order quantity from supplier for control motors. (20 points)

- (2) If the demand of this control motors follows a normal distribution, with a standard deviation of monthly demand of 10 motors. If the lead time from the supplier is 1 month. What is the reorder point and safety stock for this company if a service level of 97.7% is required? (10 points)