注意：背面有試題

1. (16 points) Please explain the following terms：
   a. (4 points) level capacity strategy
   b. (4 points) gatekeeping
   c. (4 points) operating characteristic curve
   d. (4 points) backflushing

2. (6 points) 請解釋 5S 運動的第一個 S（整理）與第二個 S（整頓）。

3. (20 points) Bob Sage & Sons Company, a manufacturer of sports equipment, has been using an MRP system successful for about 2 years. Recently, Bob Sage, the plant owner, decided to investigate the use of lot sizing for MRP-generated orders. As a test case, Bob selected a typical product in their line of fishing rods and gathered data each week for over a month's time. Using the weekly requirements and cost data given below, please help Bob determine if the EOQ (Economic Order Quantity) or POQ (Periodic Order Quantity) lot-sizing technique is less costly. 【請將計算過程與決策說明寫出來，否則不計分，換言之，只寫答案不計分】

| Period | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Demand | 20 | 40 | 30 | 10 | 45 |

Order Cost = $100 per order

Holding Cost = $1 per unit per week

Lead Time = 0

4. (8 points) Determine the number of containers needed for a workstation that uses 100 pars per hour if the time for a container to complete a cycle (move, wait, empty, return, fill) is 120 minutes and standard container holds 80 parts. An inefficient factor of 0.20 is currently being used. 【請將計算過程寫出來，否則不計分，換言之，只寫答案不計分】

5. (15 points) Please identify the major advantages (or differences) of *service blueprint* beyond the traditional *flowchart*.

6. (15 points) A car washer has the option of purchasing two types of automatic washing machines. Fixed and variable costs are as follows. Machine A has an annual fixed cost $150,000 and a variable cost of $5 per car, and Machine B has an annual fixed cost of 190,000 and a variable cost of $4 per car. Determine the range of annual volume for which each of the alternatives would be best.

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7. (20 points) There are 11 operational activities (a、b、c、d、e、f、g、h、i、j、k) in a plant, in which the precedence diagram is presented in the table below. We assume that the plant operates 8 hours per day, and the daily production volume is 300 units. Using a line balancing procedure, please determine the cycle time and the minimum number of workstations (10 points), and compute the efficiency of the production line (10 points).

參考用

| Operational activities | Operational time (Min) | Precedence activities |
|---|---|---|
| A | 0.3 | - |
| B | 0.5 | - |
| C | 0.2 | - |
| D | 0.4 | A |
| E | 1.2 | B |
| F | 0.1 | C |
| G | 0.2 | D |
| H | 0.6 | E, F |
| I | 0.2 | G |
| J | 0.5 | H, I |
| K | 0.3 | J |

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