

淡江大學 97 學年度碩士班招生考試試題

143-1

143-1

系別：管理科學研究所

科目：生產與作業管理

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| 准帶項目請打「V」 | |
| ✓ | 簡單型計算機 |

本試題共 2 頁，2 大題

本考試使用時間為 90 分鐘，請注意時間的控制！！

I. Definition of Terms (2% each, 20% total)

- 1.1) Tactics
- 1.2) Six sigma
- 1.3) PDCA
- 1.4) Delphi method
- 1.5) Supply chain
- 1.6) Capability analysis
- 1.7) Bullwhip effect
- 1.8) Cycle time
- 1.9) Rough-cut capacity planning
- 1.10) Mass customization

II. Problems (80%)

2.1) Develop a line trend equation for the following data. (10%)

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|------------|----|----|----|----|----|
| Period (X) | 1 | 2 | 3 | 4 | 5 |
| Demand (Y) | 40 | 50 | 45 | 60 | 65 |

2.2) The owner of Old Pies will require leasing new equipment for a monthly payment of \$5000. Variable costs would be \$3 per pie, and pies would retail for \$8 each. (5% each, 15% total)

- (a) How many pies must be sold in order to break even?
- (b) What would the profit (loss) be if 800 pies are made and sold in a month?
- (c) How many pies must be sold to realize a profit of \$9000?

2.3) A manufacturer uses 48000 wheels per year for truck series. The firm makes its own wheels, which it can produce at a rate of 800 per day. The trucks are assembled uniformly over the entire year. Carrying cost is \$2 per wheel a year. Setup cost for a production run of wheels is \$90. The firm operates 240 days per year. (5% each, 15% total)

本試題雙面印製

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143-2

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- (a) Determine the optimal run size.
(b) Determine minimum total annual cost for carrying and setup.
(c) Determine cycle time for the optimal run size.
- 2.4) Using a work center is 400 parts per day, and a standard container holds 25 parts. It takes an average of 0.15 day for a container to complete a circuit from the time a kanban card is received until the container is returned empty. Compute the number of kanban cards (containers) needed if the policy variable is 0.25 that reflects possible inefficiency in the system (10%)
- 2.5) A process has a mean of 10 grams and a standard deviation of 0.40 grams. The lower specification limit is 8 grams and the upper specification limit is 11.50.
(a) Please compute C_p (7%)
(b) Please compute C_{pk} (8%)
- 2.6) Customers arrive at a bakery on weekday morning. The arrival distribution can be described by a Poisson distribution with a mean of 18 customers per hour. Each clerk can serve a customer in an average of two minutes; this time can be described by an exponential distribution with a mean of 2 minutes. (5% each, 15% total)
(a) What is the service rate?
(b) Compute the average number of customers being served at any time.
(c) Determine the system utilization for 2 servers.