

國立中央大學102學年度碩士班考試入學試題卷

所別：工業管理研究所碩士班 不分組(一般生) 科目：生產作業與管理 共 2 頁 第 1 頁

本科考試禁用計算器

*請在試卷答案卷(卡)內作答

參考用

1. (25 points) Consider the following payoff table for three product decisions (A, B, and C) and three future market conditions (payoff = \$ millions).

DECISION	Market Condition		
	1	2	3
A	\$2.0	\$4.0	\$1.0
B	1.6	2.4	1.8
C	1.4	1.8	3.4

- (a). (15 points) Determine the best decision using the following decision criteria. 【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】
1. (3 points) Maximax
 2. (3 points) Maximin
 3. (3 points) Minimax Regret
 4. (3 points) Hurwicz ($\alpha = 0.2$)
 5. (3 points) LaPlace
- (b). (10 points) Given the probabilities of market conditions as follows: $p(1) = 0.3$, $p(2) = 0.5$, $p(3) = 0.2$. Please calculate the EVPI (Expected Value of Perfect Information) of this problem. 【請將計算過程與說明寫出來，否則不計分】
2. (16 points) When should the following sequencing rules be used?
1. (4 points) SPT (Shortest Processing Time)
 2. (4 points) Johnson's rule
 3. (4 points) DDATE (Earliest Due Date)
 4. (4 points) FCFS (First-Come, First-Served)
3. (9 points) Please explain the following terms.
1. (3 points) takt time
 2. (3 points) DMAIC
 3. (3 points) Cross-Docking

注意：背面有試題

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4. (10 points) A car dealer wants to predict quarterly demand for a certain model for periods 15 and 16, which happen to be the second and third quarters of a particular year. The series consists of both trend and seasonality. The trend portion of demand is projected using the equation: $F_t = 124 + 7.5t$, and the quarter relatives are $Q_1 = 1.20$, $Q_2 = 1.10$, $Q_3 = 0.75$, $Q_4 = 0.95$. Using the information to predict demand for periods 15 and 16.
5. (10 points) A useful tool for conceptualizing a service delivery system is the service blueprint. Please identify the major steps in service blueprint.
6. (15 points) A manager has the option of purchasing one, two, or three machines. Fixed cost and potential volumes are as follows:

#machines	Total annual fixed cost	Corresponding range of output
1	\$9,600	0 to 300
2	\$15,000	301 to 600
3	\$20,000	601 to 900

Variable cost is \$10 per unit, and revenue is \$40 per unit. Please answer the following: a) (7 pts) determine the break-even point for each range; b) (8 pts) if projected annual demand is between 580 and 660 units, how many machines should the manager purchase?

7. (15 points) Given the following process layout data for locating four departments (A, B, C, and D) in five areas (1, 2, 3, 4, and 5) among which one of the areas is a dummy area:

FROM/TO	A	B	C	D
A	-	10	40	50
B	30	-	10	70
C	60	10	-	40
D	30	50	20	-

FROM/TO	1	2	3	4	5
1	-	50	100	150	180
2		-	50	100	120
3			-	50	60
4				-	160

- a) (7 pts) If department C must be located in area 1, what layout will minimize the total distance loads will be moved each month?
- b) (8 pts) If transportation costs are \$50 (unit: dollar/ton-km), what are total monthly costs for an optimum layout?

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