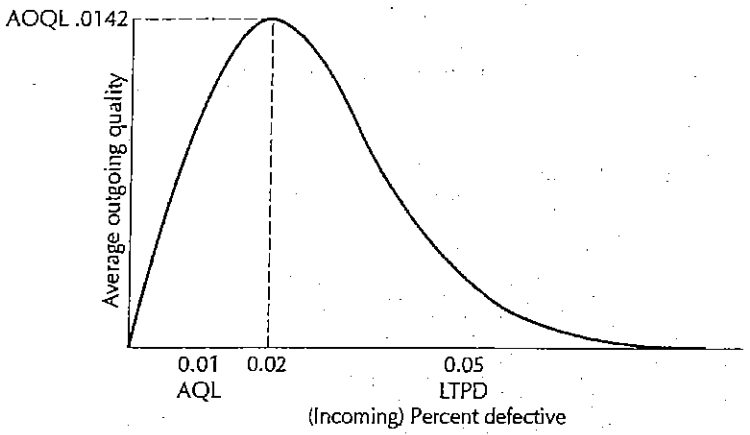
國立中央大學 105 學年度碩士班考試入學試題

所別： 工業管理研究所 碩士班 不分組(一般生)　　共 3 頁 第 1 頁

科目： 生產作業與管理

本科考試禁用計算器　　＊請在答案卷(卡)內作答

1. (15 pts) The figure below shows an AOQ (Average Outgoing Quality) curve of an acceptance sampling plan. Please answer the following questions.



   a. (2 pts) In the figure, AQL is the acronym for three English words. What are they?
   b. (3 pts) In the figure, LTPD is the acronym for four English words. What are they?
   c. (10 pts) The AOQ curve of every acceptance plan has similar shape attributes. As one can see in the AOQ curve shown below, as the lot's percent defective increases from the zero value, the AOQ of the acceptance sampling plan will also increases from the zero value. However, once the AOQ of the acceptance sampling plan has reached the AOQL (Average Outgoing Quality Limit), if the lot's percent defective increases even further, the AOQ of the acceptance sampling plan will decrease, i.e. get better. Can you explain why the AOQ curve of an acceptance plan has these shape attributes?

2. (12 pts) A manufacturing company had the following average raw materials, work-in-process, and finished goods inventory on hand at any one time during the past year.

RAW MATERIALS	AVERAGE INVENTORY	UNIT COST
1	135	$28.50
2	67	20.20
3	210	11.75
4	97	33.25
WORK-IN-PROCESS	AVERAGE INVENTORY	UNIT COST
5	40	$170.00
6	65	235.00
FINISHED GOODS	AVERAGE INVENTORY	UNIT COST
7	25	$680.00
8	18	1060.00
9	35	530.00

注意：背面有試題

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The company's cost of goods sold last year was $2.83 million, and it operates 365 days per year.

a. (6 pts) Determine the company's inventory turns.

b. (6 pts) Determine the company's days of supply.

【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】

3. (12 pts) A manufacturing firm has been offered a particular component part it uses according to the following discount pricing schedule provided by the supplier.

1–199	$68
200–599	$62
600+	$59

The manufacturing company uses 700 of the components annually, the annual carrying cost is $14 per unit, and the ordering cost is $275.

a. (12 pts) Determine the amount the firm should order.

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4. (6 pts) Describe the following terms that are related to the MRP process.

a. (3 pts) explosion

b. (3 pts) time phasing

5. (5 pts) The ABC Motor Company starts production for a particular type of motor with a steel motor housing. The production process begins with 200 motors each day. The percentage of good motors produced each day averages 75% and the percentage of poor-quality motors that can be reworked is 40%.

a. (3 pts) Please calculate the company's daily product yield.

b. (2 pts) Please calculate the effect on the company's productivity if the daily percentage of good-quality motors is increased to 85%.

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6. (10 pts) A company has introduced a process improvement that reduces processing time for each unit, so that output is increased by 25% with less material, but one additional worker required. Under the old process, five workers could produce 60 units per hour. Labor costs are $12/hour, and material input was previously $16/unit. For the new process, material is now $10/unit. Overhead is charged at 1.6 times direct labor cost. Finished units sell for $31 each. What increase in productivity is associated with the process improvement?

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7. (10 pts) Describe the step-by-step procedure for locational cost-profit-volume analysis.

8. (10 pts) Describe the basic concept of Kano model.

9. (10 pts) Given the following process layout data (distance and flow quantity) for locating four departments (A, B, C, and D) in four areas (1, 2, 3, and 4):

From/To	1	2	3	4
1	–	50	100	150
2		–	50	100
3			–	50
4				–

From/To	A	B	C	D
A	–	10	40	50
B	30	–	10	70
C	60	10	–	40
D	30	50	20	–

9.1. (5 pts) If department C must be located in area 1, what layout will minimize the total distance loads will be moved each month?

9.2. (5 pts) If transportation costs are $.25 per load per foot moved, what are total monthly costs for an optimum layout?

10. (10 pts) A clothing manufacturer produces clothing in five locations in China. In a move to vertical integration, the company is planning a new fabric production plant that will supply fabric to all five clothing plants. The clothing plants have been located on a coordinate system as follows:

Location	(X,Y)
A	7,2
B	4,7
C	5,5
D	6,2
E	8,4

10.1. (5 pts) If the amount of fabric shipped to each plant is equal, what is the optimal location for the fabric plant?

10.2. (5 pts) Shipments of fabric to each plant vary per week as follows: plant A, 200 units; plant B, 400 units; plant C, 300 units; plant D, 300 units; and plant E, 200 units. What is the optimal location for the fabric plant?