國立臺灣科技大學103學年度碩士班招生試題

系所組別： 工業管理系碩士班乙組

科　　目： 生產管理

（總分為100分）

1.(15%) The utilization of a machine is 50%. The machine has a design capacity of 70 units per hour and an effective capacity of 60 units per hour. Find the efficiency of the machine.

2.(14%) The following is a list of components required to produce one unit of end item P:

P:　2 A's, 3 B's, 3 C's
A:　5 M's, 2 R's
B:　1D, 3N's
C:　1T, 4N's
M:　1N

Determine the number of N's that will be needed to make 60 P's in each of these cases:

A) There are currently 10 P's on hand. (7%)

B) On hand inventory consists of 15 P's, 10A's, 20B's, 10C's, 100N's, 300T's and 200M's. (7%)

3.(21%) A service garage uses 120 boxes of cleaning cloths a year. The boxes cost $6 each. Ordering cost is $3 and holding cost is 10 percent of purchasing cost per unit on an annual basis. Determine:

A) The economy order quantity. (7%)

B) The total cost of carrying the cloths (excluding purchasing price). (7%)

C) The average inventory. (7%)

4. (10%) A) Refer to the following figure and derive the Economic Production Quantity model (8%). B) Suppose that some material comes from outsourcing, how to adjust the EPQ model? (2%)
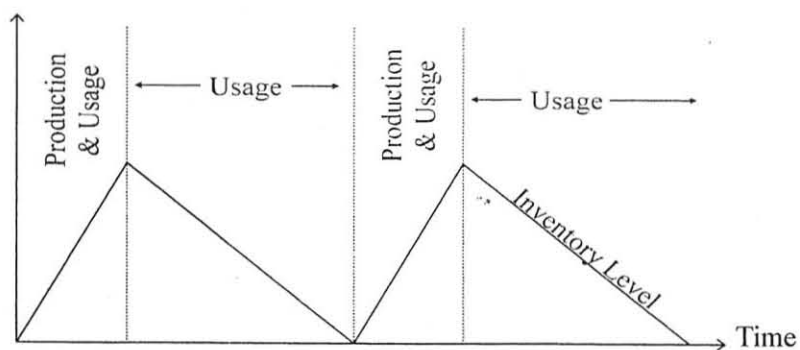
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5. (20%) Construct a monthly forecast model for the next four months for the product. Explain your method in detail and why you choose the method you used.

Month	Product Demand	Month	Product Demand
1	40	8	47
2	38	9	42
3	41	10	43
4	46	11	42
5	42	12	49
6	41	13	43
7	41	14	45

6. (20%) A shop works a 400-minute day. The manager of the shop wants an output of 200 units per day for the assembly line that has the elemental tasks shown in the following table. Do the following:

a. Construct the precedence diagram. (5%)

b. Assign tasks according to the *most following tasks* rule and compute the efficiency for each rule. (10%)

c. If Task b requires 3 minutes to work, how to conduct line balancing? (5%)

Task	Duration (minutes)	Following Task(s)
a	0.5	b, c, d
b	1.5	e
c	1.2	e
d	0.7	f
e	0.5	g,j
f	1.0	i
g	0.4	h
h	0.3	k
i	0.5	j
j	0.8	k
k	0.9	m
m	0.6	(The last task)