考生注意事項：
一、考試時間 100 分鐘。
二、答題請標註題號。

試題一：〈10 分〉

A cosmetics company uses exponential smoothing with trend to forecast monthly sales of its special face cream. At the end of June the company wants to forecast sales for July. The trend through March has been 8 additional boxes sold per month. Average sales have been 62 boxes per month. The demand for April was 70 boxes. The company uses $\alpha = 0.2$ and $\beta = 0.1$. Make a forecast including trend for the month of August.

試題二：〈15 分〉

The right table contains information related the major activities of a research project. Use the information to:

(a) find the critical path;

(b) determine the expected length of the project.

Activity	Precedes	Expected Time(days)
a	c, b	5
c	d	8
d	i	2
b	i	7
e	f	3
f	m	6
i	m	10
m	End	8
g	h	1
h	k	2
k	End	17

試題三：〈10 分〉

Briefly discuss the benefits of "**postponement**".

試題四：〈15 分〉

A machine shop has the following batch of jobs that need to be scheduled so the make span is minimized. Each job is processed first at Machine Center 1 and then at Machine Center 2. The job information is:

Job	Machine Center 1 Processing Time (days)	Machine Center 2 Processing Time (days)
A	2.58	3.47
B	1.66	5.84
C	2.71	2.41
D	5.52	1.99
E	3.38	7.62
F	5.22	1.73
G	2.89	1.11

(a) Using Johnson's rule, develop a sequence for the machine shop.

(b) Construct a diagram to determine the throughput time and idle time at each Machine Center.

試題五：〈10 分〉

A chocolate maker has contracted to operate a small candy counter in a fashionable store. To start with, the selection of offerings will be intentionally limited. The counter will offer a regular mix of candy made up of equal parts of cashews, raisins, caramels, and chocolates, and a deluxe mix that is one-half cashews and one-half chocolates, which will be sold in one-pound boxes. In addition, the candy counter will offer individual one-pound boxes of cashews, raisins, caramels, and chocolates.

A major attraction of the candy counter is that all candies are made fresh at the counter. However, storage space for supplies and ingredients is limited. Bins are available that can hold the amounts shown in the Table 1.

In order to present a good image and to encourage purchases, the counter will make at least 20 boxes of each type of product each day. Any leftover boxes at the end of the day will be removed and given to a nearby nursing home for goodwill. The profit per box for the various items has been determined as follows (Table 2):

Table 1

Ingredient	Capacity (pounds per day)
cashews	120
raisins	200
caramels	100
chocolates	160

Table 2

Item	Profit per box
regular	$ 0.8
deluxe	0.9
cashews	0.7
raisins	0.6
caramels	0.5
chocolates	0.75

Present the formulation of Linear Programming model.

試題六：〈 15 分 〉

A manager has compiled estimated profits for various capacity alternatives but is reluctant to assign probabilities to the states of nature. The payoff table is as follows:

		State of nature	
		#1	#2
Alternative	A	$20	$140
	B	$120	$80
	C	$100	$40

a. Plot the expected-value lines on a graph.
b. Is there any alternative that would never be appropriate in terms of maximizing expected profit?
c. For what range of P(2) would alternative A be the best choice if the goal is to maximize expected profit?
d. For what range of P(1) would alternative A be the best choice if the goal is to maximize expected profit?

試題七：〈 10 分 〉

The forecast for each period is 50 units. The starting inventory is 66. The MPS rule is to schedule production if the projected inventory on hand is negative. The production lot size is 100 units. The following table shows committed orders. Determine the projected on-hand inventory, MPS and ATP for each period.

Starting Inv.=66	1	2	3	4	5	6
Forecast	50	50	50	50	50	50
Customer orders	54	50	42	53	18	6
Projected on-hand inventory						
MPS						
ATP						

試題八：〈 15 分 〉

名詞解釋

    a. Lean production
    b. Order qualifiers & Order winners
    c. Delayed differentiation
    d. Delphi method
    e. Utilization & Efficiency