國立成功大學

112學年度碩士班招生考試試題

編　號：195

系　所：製造資訊與系統研究所

科　目：生產管理

日　期：0206

節　次：第 2 節

備　註：不可使用計算機

編號： 195

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※ 考生請注意：本試題不可使用計算機。　請於答案卷(卡)作答，於本試題紙上作答者，不予計分。

- Multiple choice questions (**10** points for each correct answer or **-3** points for each incorrect answer):

1. The following table shows the sales data of a particular model of a DVD player. If the forecast sales for May is 36.25, calculate the sales forecast for July using the simple exponential smoothing (SES) model with a smoothing constant of 0.40.

Month	Sales
Jan	35
Feb	29
Mar	39
Apr	42
May	51
Jun	56

a. The sales forecast for July is more than 30 but less than or equal to 35.

b. The sales forecast for July is more than 35 but less than or equal to 40.

c. The sales forecast for July is more than 40 but less than or equal to 50.

d. The sales forecast for July is more than 50 but less than or equal to 55.

e. The sales forecast for July is more than 55 but less than or equal to 60.

2. The specifications for a refrigerator part (in cm) are 5.00 ± 0.10, and the Taguchi loss function is estimated to be $L(x) = 5{,}500\ (x - T)^2$. Determine the estimated loss per part if the quality characteristic (i.e., actual process performance) under study takes on a value of 4.91 cm.

a. Less than $30

b. More than $30 but less than or equal to $50

c. More than $50 but less than or equal to $70

d. More than $70 but less than or equal to $90

e. More than $90

3. Microserve provides computer repair service on a contract basis to customers in five sections of the city. The five sections, the number of service contracts in each section, and the x, y coordinates of each section are as follows. Use the center-of-gravity method to determine an ideal location for a service center.

Section	No. of Contracts	Coordinates	
		x	y
Parkview	90	8.0	10.5
Mt. Airy	220	6.7	5.9
Valley	50	12.0	5.2
Norwood	300	15.0	6.3
Southgate	170	11.7	8.3

a. The x coordinate and y coordinate are less than 7.
b. The x coordinate is less than 7 and the y coordinate is more than 7.
c. The x coordinate is more than 7 and the y coordinate is less than 7.
d. The x coordinate and the y coordinate are more than 7 and less than 10.
e. The x coordinate and y coordinate are more than 10.

4. A car rental company at a major airport on an average rents 70 percent of its fleet of 200 cars per day. The cars are rented for an average of 4 days. What is the average number of rentals processed per day?

a. More than 10 but less than or equal to 50 cars per day
b. More than 50 but less than or equal to 100 cars per day
c. More than 100 but less than or equal to 150 cars per day
d. More than 150 but less than or equal to 200 cars per day
e. More than 200 but less than or equal to 250 cars per day

5. An automobile emissions testing center has three inspectors and tests 35 vehicles per hour. What should the service rate be in order to achieve a target utilization of 95 percent?

a. More than 1 but less than or equal to 4 vehicles per hour
b. More than 4 but less than or equal to 8 vehicles per hour
c. More than 8 but less than or equal to 12 vehicles per hour
d. More than 12 but less than or equal to 16 vehicles per hour
e. More than 16 but less than or equal to 20 vehicles per hour

6. Using the data regarding the inventory management of a stock-keeping unit shown in the following table, it can be concluded that the economic time interval for establishing an optimal policy for a fixed-period system (FPS) under the model assumptions is:

Demand	12,000 units per year
Order Cost	$50 per order
Inventory-Holding Cost	$0.5 per unit per year
Lead Time	2 weeks
Standard Deviation in Weekly Demand	7
Service Level	95 percent

a. less than or equal to 1.5 weeks.
b. more than 1.5 weeks but less than or equal to 3 weeks.
c. more than 3 weeks but less than or equal to 4.5 weeks.
d. more than 4.5 weeks but less than or equal to 6 weeks.
e. more than 6 weeks.

7. Net Steels is a steel manufacturing company. It orders 180 metric tons of raw material per order. It was observed that the company often faces stockout. To tackle this issue, the company incorporated a fixed-quantity system (FQS) and collected the following data.

Demand	11,000 metric tons per year
Order Cost	$18,000 per order
Item Cost	$36,000 per year
Inventory-Holding Cost	20 percent per year

Using the data, Net Steels determined that the economic order quantity (EOQ) should be 235 metric tons. In this scenario, the annual amount that Net Steels can save by ordering as per the EOQ instead of its conventional order is:

a. less than $35,000.
b. more than $35,000 but less than or equal to $45,000.
c. more than $45,000 but less than or equal to $55,000.
d. more than $55,000 but less than or equal to $65,000.
e. more than $65,000.

8. A company currently has 100 items in inventory. The demand for the next four months is 500, 800, 900, and 300 units. Determine the monthly production rate if a level strategy is selected with the goal of ending the fourth month with 400 units in inventory.

a. 500 units/month
b. 700 units/month
c. 900 units/month
d. 1100 units/month
e. 1300 units/month

9. There are five jobs in a factory. All these jobs have to go through two workstations for processing. Each job is processed on Workstation #1 and then on Workstation #2. The processing time for each job on each workstation is given below.

Job	Time on Workstation #1(minutes)	Time on Workstation #2(minutes)
A	50	50
B	20	8
C	25	50
D	30	12
E	11	22
F	11	19

Using Johnson's sequencing rule, it can be concluded that the makespan of the sequence is:

a. more than 30 but less than or equal to 60 minutes.
b. more than 60 but less than or equal to 90 minutes.
c. more than 90 but less than or equal to 120 minutes.
d. more than 120 but less than or equal to 150 minutes.
e. more than 150 but less than or equal to 180 minutes.

10. Five jobs are ready for processing at time zero through a workstation. The details of the processing time and the due date of completion is provided in the following table.

Job	Processing Time (days)	Due Date
A	5	11
B	6	16
C	3	19
D	4	10
E	2	9

Using the earliest due date (EDD) rule, the average lateness for the five jobs is:

a. more than -4 but less than or equal to -1 days.

b. more than -1 but less than or equal to 2 days.

c. more than 2 but less than or equal to 5 days.

d. more than 5 but less than or equal to 8 days.

e. more than 8 but less than or equal to 11 days.