4- production run model is a an EOQ model with *instantaneous receipt*:

a) True

b) False

5- Not Assumptions Of LP

a) Proportionality

b) Additivity

c) Divisibility

d) Negative variables

6- Unboundedness In a maximization problem, one or more solution variables, and the profit, can be made infinitely large without violating any constraint it .

a) True

b) False

7- **Redundancy**:

a) A redundant constraint is one that affect the feasible solution region

b) One or more constraints may be more binding

c) More than optimal solution.

d) None of Above .

8- If a transportation problem has 8 sources and 9 destinations, the linear program for this will have:

e) 8 variables and 9 constraints.

f) 9 variables and 8 constraints.

g) 17 variables and 30 constraints.

h) 82 variables and 11 constraints.

2) A Firm has four destinations and three sources for supply of goods. The transportation cost per unit is given below. The entire availability is (250,200,250) units which exceeds the cumulative demand of (100,150,250,100) units. How can the firm manager reduce the total cost.(5 Marks)

	S1	S2	S3
D1	50	40	30
D2	80	70	50
D3	90	60	20
D4	60	80	30

	S_1	S_2	S_3	supply
D_1	50	100	20	100
D_2	80	20	50	150
D_3	90	60	20	250
D_4	60	80	30	100
demand	250	200	250	600 / 200

[1] banks ✓ north west [2]

① A 50 − 50 = 50
B 40 − 40 = 40
C 20 − 20 = 20
D 40 − 30 = 10
E 50 − 70 = 20
F 20 − 60 = 40
G 30 − 60 = 30

	A	B	C	
D	50	X	100	100
E			50	150
F	X	X	250	250
G		50	50	100
	250	200	250	700

	①	②	③	
G	100		30	100
F	150	0	40	150
E		200	50	250 / 50
D		50	100	100
C		0	100	100
	250	200	250 / X	700

Wishes for success

Path 4+3−1 = 6 ✓ (6)

9- In a transportation problem, what indicates that the minimum cost solution has been found?

a) all improvement indices are negative or zero
b) all improvement indices are positive or zero
c) all improvement indices are equal to zero
d) all cells in the dummy row are empty

10- If a solution to a transportation problem is degenerate, then

a) it will be impossible to evaluate all empty cells without removing the degeneracy.
b) a dummy row or column must be added.
c) there will be more than one optimal solution.
d) the problem has no feasible solution.

***Q2: (10 points)*:Solve following problems:**

1) Alsafa Corporation manufactures two electrical products: air conditioners and large fans. The assembly process for each is similar in that both require a certain amount of wiring and drilling. Each air conditioner takes 3 hours of wiring and 2 hours of drilling. Each fan must go through 2 hours of wiring and 1 hour of drilling. During the next production period, 240 hours of wiring time are available and up to 140 hours of drilling time may be used. Each air conditioner sold yields a profit of $25. Each fan assembled may be sold for a $15 profit. Formulate and solve this LP production mix situation to find the best combination of air conditioners and fans that yields the highest profit.

+ Tow products: ① air conditioners (C) wiring / 3 hours drilling / 2 profit = 25
② Large fan (F) wiring / 2 hours drilling / 1 profit = 15
240 140

Subject :-

Function objective
Profit = 25C + 15F

I $3C + 2F \leq 240$
II $2C + 1F \leq 140$

C = 0
I $3C + 2F = 240$
$3(0) + 2F = 240$
$\frac{2F}{2} = \frac{240}{2}$
F = 120
(0, 120) ①

F = 0
II $3C + 2F = 240$
$3C + 2(0) = 240$
$\frac{3C}{3} = \frac{240}{3}$
C = 80
(80, 0) ②

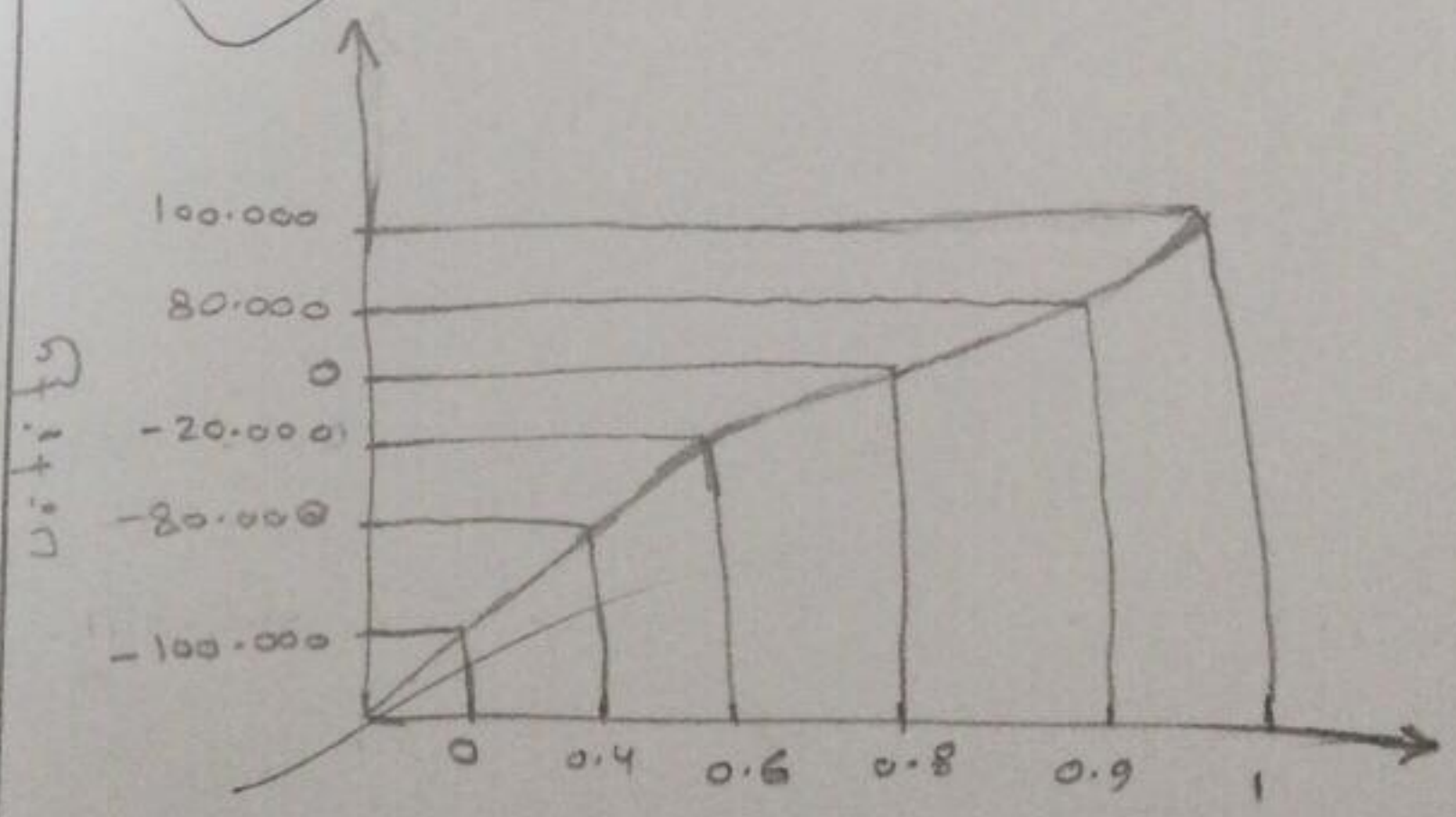
① C = 0
$2(0) + 1F = 140$
$2F + F = 140$ ③
F = 140 (0, 140)

② F = 0 ④
$2C + 1(0) = 140$
$\frac{2C}{2} = \frac{140}{2}$
C = 70 (70, 0)

Q2) (3 Marks)Compute the expected utility given the following utility table. Does this utility table represent a risk seeker or a risk avoider?

MONETARY VALUE	UTILITY
$100,000	1
$80,000	0.9
$0	0.8
–$20,000	0.6
–$80,000	0.4
–$100,000	0

Utility Curve



(risk avoider)

wishes for success

Q2) (12 Marks)Ahmed has been thinking about starting his own independent gasoline station. Ahmed's problem is to decide how large his station should be. The annual returns will depend on both the size of his station and a number of marketing factors related to the oil industry and
demand for gasoline. After a careful analysis, Ahmed developed the following table:

	GOOD MARKET(p=0.40)	FAIR MARKET(p=0.30)	POOR MARKET(p=0.30)
Small	50.000	20.000	-10.000
Medium	80.000	30.000	-20.000
Large	100.000	30.000	-40.000
Very large	300.000	25.000	-160.000

(a) What is the criterion of realism decision? Use an value of 0.7.
(b) Develop an opportunity loss table. (EOL)
(c) What is the Minimax regret decision?
(d) Develop a decision tree for this decision.

(a)

	Good Market	fair market	Poor market	Criterion realism α=0.7
small	50,000	20,000	-10.000	42.000
Medium	80,000	30,000	-20.000	49.000
Large	100,000	30.000	-40.000	63.000 ← realism
very large	300,000	25.000	-16.000	-73.000

E (small) = (50,000)(0.7) + (20,000)(0,7) + (-10.000)(0.7)
= 42.000

E (Medium) = (80,000)(0.7) + (30.000)(0.7) + (-20,000)(0.7) = 49,000

E(Large) = (100,000)(0.7) + (30.000)(0.7) + (-40.000)(0.7) = 63,000

E (very large) = (30.000)(0.7) + (25.000)(0.7) + (-160.000)(0.7) = -73,000

(b)

	Good Market	fair market	Poor market	EOL
small	250,000	10,000	0	103,000
Medium	220,000	0	10,000	91,000
Large	200,000	0	30,000	89,000 → EOL
very large	0	5,000	150,000	91,000

EoL (small) = (250,000)(0.40) + (10,000)(0.30) + 0(0.30) = 103,000

EoL (Medium) = (220,000)(0.40) + (0)(0.30) + (10,000)(0.30) = 91,000

Eol (Large) = (200,000)(0.40) + (0)(0.30) + (30,000)(0.30) = 89,000

~~Eol (very large) = 0(0.40) + (5,000)(0.30) + (150,000)(0.30)~~

= 91,000

Q1: ***(10 points)*****:Choose The Best Answer:**

1- No Need of inventory in:

a) The decoupling function

b) Storing resources

c) Regular supply and demand

d) Quantity discounts

2- There are only two fundamental decisions in controlling inventory:

a) EOQ & L

b) ROP &EOQ

c) QEL & POR

d) L & D

3- **Safety stock mean adjest:**

a) EOQ

b) Demand

c) ROP

d) L