King Fahd University of Petroleum and Minerals
Department of Mathematics and Statistics
Math131-01 / Instructor: Prof. Bilal Chanane
Major Exam I Duration 2hrs

Name:.....ID:.....

Question	**Points**	**Mark**
1	**10**	
2	**10**	
3	**12**	
4	**12**	
5	**16**	
6	**10**	
7	**14**	
8	**16**	
Total	**100**	

Exercise 1 *A total of $ 19800 was invested in two businesses, A an B. At the end of the first year , A and B returns 8.9 % and 3.6 % , respectively, on the original investment. How was the original amount allocated if the total amount earned was $ 1391.2 ?*

Exercise 2 *A cloth manufacturer is planning to sell its new line of jeans to retail outlets. The cost to the retailer will be $ 6.64 per pair of jeans. As a convenience to the retailer, the manufacturer will attache a price tag to each pair. What amount should be marked on the price tag so that the retailer can reduce this price by* 17 *% during a sale and still make a profit of 35 % on the cost ?*

Exercise 3 *For a particular product, the supply equation is y=2x+479 and the demand equation is y=-6x+743.*

(a) What is the intersection point of these two lines?

(b) What is the selling price when supply and demand are in equilibrium?

(c) What is the amount of items in the market when supply and demand are in equilibrium?

Exercise 4 *Let the demand function for a product be given by the function D(q)=-1.5q+230, where q is the quantity of items in demand and D(q) is the price per item, in dollars, that can be charged when q units are sold. Suppose fixed costs of production for this item are $ 3000 and variable costs are $ 2 per item produced. If 24 items are produced and sold, find the following:*

(a) The total revenue from selling 24 items (to the nearest penny).

(b) The total costs to produce 24 items (to the nearest penny).

(c) The total profit to produce 24 items (to the nearest penny.

Exercise 5 *A company produces very unusual CD's for which the variable cost is $ 9 per CD and the fixed costs are $ 45000. They will sell the CD's for $ 60 each. Let be the number of CD's produced.*

(a) Write the total cost as a function of the number of CD's produced.

(b) Write the total revenue as a function of the number of CD's produced.

(c) Write the total profit as a function of the number of CD's produced.

(d) Find the number of CD's which must be produced to break even. (Round your answer to the nearest whole CD.)

Exercise 6 *A manufacturer of ski clothing makes ski pants and ski jackets. The profit on a pair of ski pants is \$2.00 and the profit on a jacket is \$1.50. Both pants and jackets require the work of sewing operators and cutters. There are 60 minutes of sewing operator time and 48 minutes of cutter time available. It takes 8 minutes to sew one pair of ski pants and 4 minutes to sew one jacket. Cutters take 4 minutes on pants and 8 minutes on a jacket.*

(a) Find the number of pants and jackets the manufacturer should make in order to maximize the profit.

(b) What is the maximum profit?

Exercise 7 *Solve the system of inequalities using the attached graph paper,*

$$\begin{cases} x + y \leq 100 \\ x + 3y \leq 150 \\ 6x + y \geq 120 \\ y \geq 0 \end{cases}$$

Exercise 8 *Subject to the system of inequalities from the previous exercise, solve the following linear programming problems, giving all the details,*

(a) Maximize $x + 2y$

(b) Maximize $2x + 6y$