KING FAHD UNIVERSITY OF PETROLEUM & MINERALS
DEPARTMENT OF MATHEMATICS & STATISTICS
DHAHRAN, SAUDI ARABIA

MATH 131: FINITE MTHEMATICS

Semester 171
Major Exam One
Wednesday, October 11, 2017
Allowed time 75 minutes

Instructor: Musawar Amin Malik

Name: ID#:

Serial #:   Section:

Directions:

1) You must **show all your work** to obtain full credit.
2) You are allowed to use electronic calculators and other reasonable writing accessories that help write the exam.
3) Do not keep your mobile with you during the exam, turn off your mobile and leave it aside.

Question No	Full Marks	Marks Obtained
Q1	3	
Q2	4	
Q3	4	
Q4	4	
Q5	4	
Q6	4	
Q7	5	
Q8	5	
Q9	5	
Q10	7	
Total	45	

1. To manufacture an electronic component the variable cost per unit is $50, total fixed cost is $ 500,000. If the selling price for each unit is $75 find the required sales units for the manufacturer to earn a profit of $300,000?

2. Abdullah wishes to invest SR 90,000 in two investment ventures so that the total income per year will be SR 6,000. Investment A pays 5% annually; the investment B has more risk and pays $7\frac{1}{2}$% annually. How much Abdullah should invest in each?

3. A Publishing company finds that the cost of publishing each copy of a fashion magazine is $ 1.80. It is sold to dealers for $1.60 per copy. The advertising revenue is 15% of the amount received from dealers for all magazines sold beyond 80,000. What is the least number of magazines that must be sold to earn profit for the company?

4. Find an equation of the line (in slope-intercept form) passing through (4, -5) and perpendicular to the line $3y = -\dfrac{2x}{5} + 3$.

5. A recent university business graduate starts his business with a loan of $150,000. After successfully operating the business for five years he has accumulated a profit of $60,000. Find an equation of the line describing the above information.

6. A brand new car depreciates $3,000 per year, and it is worth $50,000 after four years. Find a function that describes the value of this car, if x is the age of the car in years.

7. The demand function for an electronic company's laptop computer line is $p = 3200 - 8q$, *where p* is the price (in dollars) per unit when q units are demanded (per week) by consumers. Find the level of production that will maximize the manufacturer's total revenue, and determine this revenue.

8. A computer consultant has $250,000 invested for retirement, part at 9% and part at 8%. If the total yearly income from the investment is 20,300, how much is invested at each rate? (Note: Solve using elimination by addition).

9. Solve the following system

$x^2 + y^2 - 2xy = 1$

$3x - y = 5$

10. Supply and demand equations for a certain product are

$3q - 200p + 1800 = 0 \text{ and}$

$3q + 100p - 1800 = 0$

Respectively, where p represent the price per unit in dollars and q represents the number of units sold per time period.

   a. Find the equilibrium price.
   b. Find the equilibrium price when a tax of 27 cents per unit is imposed on the supplier.