Prince Sultan University
Deanship of Educational Services
Department of Mathematics and General Sciences

COURSE DETAILS:

FINITE MATHEMATICS	**MATH 101**	**MAJOR EXAM I**
Semester:	Second Semester --Term 182	
Date:	Tuesday February 19, 2019	
Time Allowed:	90 minutes	

STUDENT DETAILS:

Student Name:			
Student ID Number:			
Section:	108	109	110
Instructor's Name:	Dr. Kamal Abodayeh		

INSTRUCTIONS:

- You may use a scientific calculator that does not have programming or graphing capabilities. NO borrowing calculators.
- NO talking or looking around during the examination.
- NO mobile phones. If your mobile is seen or heard, your exam will be taken immediately.
- Show all your work and be organized.
- You may use the back of the pages for extra space, but be sure to indicate that on the page with the problem.

GRADING:

	Page 1	**Page 2**	**Page 3**	**Total**	**Total**
Questions	1, 2, 3	4, 5, 6	7, 8		
Marks	**22**	**20**	**18**	**60**	**20**

Q1 (5+5 points)

a) Find the **general equation** for the line that passes through $(3,-2)$ and is perpendicular to the line whose equation is $2x - 4y = 7$.

b) Use graph to show that the pairs of lines is intersecting and find the intersection point.

$$L:\ 4x-2y=15$$
$$M:\ 4x+2y=5$$

Q 2 (8 points) For a charge of SR 2.00 per copy Okaz Newspaper will deliver its newspaper to your door. The cost to the Newspaper for delivery is SR 0.50 per newspaper with fixed costs of SR 1,070,000.

a) Determine the revenue R and the Cost C the Newspaper makes from delivering *x* newspapers.

b) How many copies must the newspaper sell to **break-even**.

Q 3 (4 points) The supply and demand equations for salt have been estimated to be given by the equations, where p is price: $S=0.7p+0.4$ $D=-0.5p+1.6$

Find the market price

Q4 (6 points) Let $A = \begin{bmatrix} 1 & -1 & 0 \\ 2 & 0 & 1 \end{bmatrix}, B = \begin{bmatrix} 2 & -1 \\ 0 & 1 \\ 1 & 0 \end{bmatrix}, C = \begin{bmatrix} -1 & -3 \\ -1 & 2 \end{bmatrix}$.

Evaluate $C^2 - AB$

Q5 (8 points) Solve the system of equations using **Gauss–Jordan elimination**:

$$\begin{aligned} x + 2y + z &= 2 \\ x + y + 2z &= -4. \\ 2x + 2z &= 0 \end{aligned}$$

Q6 (6 points) Write the corresponding LPP without solving it.

Blink Appliances has a sale on microwaves and stoves. Each microwave requires 2 hours to unpack and set up, and each stove requires 1 hour. The storeroom space is limited to 50 items. The budget of the store allows only 80 hours of employee time for unpacking and setup. Microwaves sell for $300 each, and stoves sell for $200 each. How many of each should the store order to maximize revenue?

Q7 (5 points) Find the inverse of the matrix $A = \begin{bmatrix} 0 & -3 & 0 & 0 \\ 2 & 0 & 0 & 0 \\ 0 & 0 & 0 & 5 \\ 0 & 0 & 4 & 0 \end{bmatrix}$.

Q8 (13 points) Find the maximum and minimum values (if possible) of the objective function $z = 5x + y$ subject to the constraints $\begin{cases} x + y \leq 10 \\ 2x + y \geq 10 \\ x \geq 0,\ y \geq 0 \end{cases}$