

Arba Minch University
Department of Mathematics
Sample Test 2

Applied I(Math 1021)
Regular 2018

Name: _____

ID.No. _____

Department: Environmental Health Sciences

Exam Date: December 30, 2018

Time Limit: 60 Minutes

Instructor: Dejen K.

This exam contains 2 pages (including this cover page) and 5 questions.
Total of points is 15.

Grade Table (for teacher use only)

- Start by printing your name in the above box and please check your section in the box to the left.
- Please write neatly. Answers which are illegible for the grader cannot be given credit.
- No notes, books, slide rules, calculators, computers, or other electronic aids can be allowed.

Question	Points	Score
1	3	
2	2	
3	3	
4	3	
5	4	
Total:	15	

1 True/ False

1. (3 points) **True/ False**

- (a) T F If A and B are invertible 2×2 matrices, then $(AB)^{-1} = A^{-1}B^{-1}$
- (b) T F A consistent system of linear equations has infinitely many solutions if and only if at least one column in the coefficient matrix does not contain a pivot position.
- (c) T F) A symmetric matrix must be a square matrix.
- (d) T F $\det(kA) = k \times \det A$, for any integer k .
- (e) T F Three elementary row operations do not change the determinant of a square matrix.
- (f) T F The system $Ax = b$ has unique solution if $\det(A) = 0$.

2 Shorts Answer

2. (2 points) **Define and short answer**

- List all possible solution of linear system with justification.
- Define **matrix, linear system, Elementary row operation, Reduce echelon form of a matrix, Eigenvalue and Eigen vector**.
- Fill the black
 - $(AB)^t = \underline{\hspace{2cm}}$
 - $(A^{-1})^{-1} = \underline{\hspace{2cm}}$

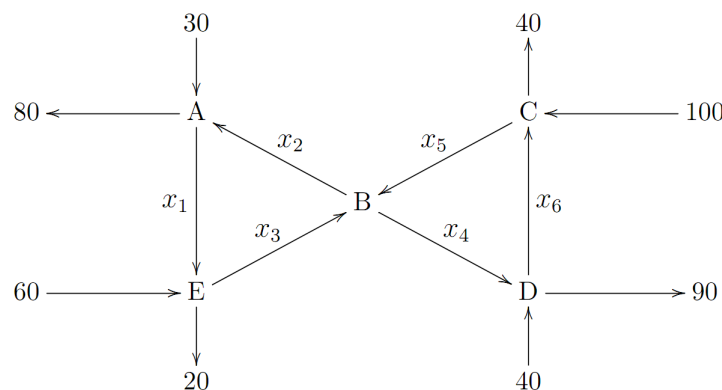
3 Workout

3. (3 points) A mine company has three mines. One day of operation at the mine produces the following output.

- Mine 1: produce 25 ton of copper , 600Kg of silver and 15 ton of magnesium
- Mine 2: produce 30 ton of copper , 500Kg of silver and 10 ton of magnesium
- Mine 3: produce 20 ton of copper , 550Kg of silver and 12 ton of magnesium

Suppose that the company has orders for 550 ton of copper, 11350 Kg of sliver and 250 ton of magnesium .

- Write the system of equation to answer the question?
 - Find the general solution of (a)?
4. (3 points) Find the general flow pattern in the network shown in the figure. Assuming that the flow must be in the directions indicated, find the minimum flows in the branches denoted by x_2, x_3, x_4 and x_5 ?



5. (4 points) Let $A = \begin{bmatrix} 2 & 0 \\ 3 & 5 \end{bmatrix}$, then find the Eigenvalue and the corresponding Eigenvector of A .