AMERICAN UNIV. of BEIRUT

QUIZ - I - M.204 April 6,2002

Name:..... Sec: 1 2 3 4 5 6 7 8

Instructions:

1.Write your name and circle your section number.

2.Answer,in detail, every part in the space provided for it,and circle your final result.Do not mention just the answer.

3.The colored booklet is for scratch work and will not be corrected.

RESERVED FOR CORRECTOR

I.
II.
III.
IV.
V.
VI.
QUIZ GRADE:

► I.The solution to a system of equations having the form $AX = B$ can be found by the matrix multiplication : $X = \begin{pmatrix} 3 & -2 \\ 4 & -5 \end{pmatrix} \begin{pmatrix} 14 \\ -7 \end{pmatrix}$.

1.(5%) What is the original system of equations?

$\frac{5}{7}x_1 - \frac{2}{7}x_2 = 14$

$\frac{4}{7}x_1 - \frac{3}{7}x_2 = -7$

2.(10%) What is the solution ?

$3 \times 14 + (-2 \times -7)$

$4 \times 14 \times (-5(-7)$

► II.(10%)The following matrix gives the transition probabilities related to a market dominated by two firms,A and B:

$$T = \begin{pmatrix} 0.8 & 0.2 \\ 0.6 & 0.4 \end{pmatrix}$$

Assume currently firm A has 30% of the market share.

1.(5%) Predict the market share of A in the next period.

2.(10%) Assume the transition matrix remains stable.Find the expected equilibrium shares of the two firms if they exist.

► III.(20%)Given the matrix $A = \begin{pmatrix} 3 & -1 & -2 \\ 4 & 0 & 1 \\ 2 & 4 & -3 \end{pmatrix}$

1.Determine $A^2 = A \times A$

2.Find just the 2nd row of A_c (the matrix of cofactors of A).

3.Use the result found in part (2)above,to find $|A|$. (No other method is acceptable).

4.Use Cramer's rule to solve just for x_3 in the system: $A\begin{pmatrix} x_1 \\ x_2 \\ x_3 \end{pmatrix} = \begin{pmatrix} 5 \\ 10 \\ -15 \end{pmatrix}$.

► IV.(10%) Find the 2×4 matrix B for which $b_{ij} = \begin{cases} 2^i + j & ; \ if \ \ i = j \\ j^2 \cdot i & ; \ if \ \ i \neq j \end{cases}$

► V.(25%) A box contains eight different business books ,six different statistics books and three different history books.

1.What is the probability that a randomly selected book is a history book?

2.In how many ways can a student select one book of each type?