

AMERICAN UNIVERSITY OF BEIRUT

QUIZ I : MATH 204

March 29 ,2003

Name:.....

Sec: 1    2    3    4    5    6    7    8

I.D. ....

For correctors only:

<u>Grade of Written Part</u>	<u>Grade of Multiple Choice</u>	<u>Quiz I Grade</u>
	Number of Correct:.....x 5=.....	
	Number of Wrong :.....x(-1)=.....	
	Total M.C. Grade=.....	

Instructions:

- 1 .Write your name and I.D. and circle your section number.
2. The colored booklet is for scratch work and will not be corrected.

Answer table for the multiple choice questions. Write capital letters A , B ,C , or D next to each question.

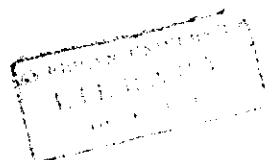
1.	9.
2.	10.
3.	11.
4.	12.
5.	13.
6.	14.
7.	15.
8.	

**Part One(Written):** Answer every part in the space provided for it ,and circle your final result .Do not mention just the answer.

I. (10 points) Use Cramer's rule to find  $x_1$  if:

$$\begin{cases} x_1 + x_2 + x_3 = 12 \\ -2x_1 - 2x_2 + x_3 = 3 \\ 3x_1 + x_2 - 4x_3 = -6 \end{cases}$$

$$\Delta \begin{pmatrix} 1 & 1 & 1 \\ -2 & -2 & 1 \\ 3 & 1 & -4 \end{pmatrix} X = \begin{pmatrix} x_1 \\ x_2 \\ x_3 \end{pmatrix} = B = \begin{pmatrix} 12 \\ 3 \\ -6 \end{pmatrix}$$



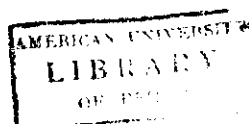
I. (20 points) Given the matrix:  $B = \begin{pmatrix} -2 & 6 \\ 2 & -7 \end{pmatrix}$

$$14 - 12 = 2$$

1. Use the gaussian procedure to find the inverse of the matrix B.

$$X = AB^{-1}$$

$$AX = B$$



2. Use the result of part 1 above to solve the system:

$$\begin{cases} -2x_1 + 6x_2 = 2 \\ 2x_1 - 7x_2 = -4 \end{cases}$$

$$A^{-1}$$

$$A^{-1}B = X$$



**Part Two:** Answer the following 15 multiple choice questions on the answer sheet .You get:

- 5 points for each correct answer  
-1 for each wrong answer  
0 for no answer

1.  ${}_6C_3 + {}_6P_3 + 5! =$   
A. 145      B. 441      C. 540      D. 260

A box contains red, green, and blue balls .Some of the balls are striped and the others are dotted.  
The following table gives the details.

	Red(R)	Blue(B)	Green(G)	Total
Striped(S)	5	8	4	17
Dotted(D)	7	6	0	13
Total	12	14	4	30

One ball is randomly taken from the box. Answer questions 2, 3, 4, and 5.

2. Find  $P(B)$   
A. 8/17      B. 6/13      C. 7/15      D. 1/3
3. Find  $P(R \cup S)$   
A. 0.45      B. 0.8      C. 0.2      D. 0.6
4. Find  $P(D|B)$   
A. 2/3      B. 1/2      C. 5/14      D. 3/7

5. The events R , S are :  
A. Dependent      B. Mutually exclusive      B. Exhaustive      D. Complementary

The probability that a student petition will be approved is 0.6 . Three such petitions are randomly selected .Answer questions 6 and 7.

6. What is the probability that all three will be approved?  
A. 0.512      B. 0.180      C. 0.216      D. 0.242
7. What is the probability that only the first petition will be rejected?  
A. 0.096      B. 0.340      C. 0.240      D. 0.144



Given the matrix  $A = \begin{pmatrix} 5 & -1 & 3 \\ 2 & 1 & 4 \\ 0 & -2 & 1 \end{pmatrix}$ . Answer questions 8 and 9.

8.  $|A| =$

- A. 35                      B. 62                      C. -17                      D. -5

9. The cofactors of the second row are, respectively:

- A.  $(-6 \ -7 \ 10)$               B.  $(2 \ -7 \ -1)$               C.  $(-5 \ 5 \ 10)$               D.  $(-5 \ 7 \ 1)$

The transition matrix of a market dominated by two brands is  $T = \begin{pmatrix} 0.7 & 0.3 \\ 0.2 & 0.8 \end{pmatrix}$ . Assume brands 1 and 2 currently each have 50% of the market share. Answer questions 10 and 11.

10. The market share of brand 1 in the next period will be:

- A. 0.45                      B. 0.35                      C. 0.65                      D. 0.25

11. What is the expected equilibrium share of brand 1?

- A. 0.60                      B. 0.30                      C. 0.40                      D. 0.25

A password consists of an English letter followed by three digits. Answer questions 12 and 13.

12. How many passwords are possible if there are no restrictions?

- A. 10000                      B. 52000                      C. 18720                      D. 26000

13. How many passwords are possible if the letter should belong to the word "prince", and the digits must be distinct and odd digits?

- A. 144                      B. 360                      C. 750                      D. 1560

A box has 5 distinct statistics books, 4 distinct history books, and 3 distinct business books. Answer questions 14 and 15.

14. Five books are selected at random from the box. If the books are not replaced in the box, what is the probability of selecting a history book, a statistics book, two history books and a business book in that order?

- A.  $\frac{1}{264}$                       B.  $\frac{1}{420}$                       C.  $\frac{1}{99}$                       D.  $\frac{5}{1296}$

15. In how many ways can a student pick two books from the box if there are no restrictions?

- A. 120                      B. 66                      C. 72                      D. 10

