Preview of MgS 3100 Exam 1
(Closed Book Test, one sheet of notes (both sides) allowed!)

Answers to questions not on proactive final.

For the other questions, see the answers for the corresponding numbers in
http://www2.gsu.edu/%7Ewwwbua/Sample%20Final.ak.DOC
Click the "Departmental Resources" link near the top of the course website, then the link for sample exam.

Note question 48 should not have been on the practice exam for exam 1.

25. The all Washed-Up Car Wash has found a tremendous bargain on a new car waxing machine imported from the newly independent Republic of Lowenbrau. The only weak point is the special wax pump, which can be expected to fail relatively frequently and cannot be repaired. AWUCW can order up to five replacement pumps at a time, which would be delivered with the annual end of year shipment from Lowenbrau. They are available at no other time, and are expensive. If the wax pump fails and they have no replacement, they must stop using the machine until the next shipment arrives. The probabilities of breakdowns during any given year are given below:

Breakdowns per year	**Probability**	Lower Bound	Upper bound
0	0.30	0	.30
1	0.25	.30	.55
2	**0.15**	**.55**	**.70**
3	0.12	.70	.82
4	0.10	.82	.92
5	0.08	.92	1.00
Sum	1.00		

In an average year, how many pumps can they expect to fail?
A) 0 B) 1.71 C) 2.25 D) 4.81 E) 5.00

0*.30 + 1*.25 + 2*.15 + 3*.12 + 4*.10 + 5*.08 = 0+.25+.30+.36+.40+.40 = 1.71

25.1 . Using the data for Problem 25, develop random number ranges to represent each level of demand, beginning the first random number range with 0.00 (zero), and ending with 0.999. Which of the following statements is true?

a. The random number range for breakdowns = 4 is 0.66-0.85.
b. The random number range for breakdowns = 3 is 0.40-0.65.
c. The random number range for breakdowns = 5 is 0.85-0.99.
d. The random number range for breakdowns = 2 is 0.55-0.70.
e. The random number range for breakdowns = 5 is 0.01-0.85.

Answer =D. See the emphasized row above

25.2 Using the data for Problem 25, suppose the random number .59 has been selected for one particular simulated year; how many simulated breakdowns occur in that simulated year?
A 1 B. 2 C. 3 D. 4 E. 5

Answer B. Also read from the emphasized wow above

51. Selling price per unit is $35; Variable cost per unit is $8; Salvage value per unit is $3;
Cost of lost sales is $2 per unit. Find the profit (π) when 50 units are produced and the state of nature is a demand of 60 units. Do not include fixed costs.

a. π = 35*60 - 8*60 + 3*10
b. π = 35*50 - 8*50 - 2*10
c. π = 35*50 - 8*60 + 3*10
d. π = 35*60 - 8*50 + 3*10 - 2*10
e. π = 35*50 - 8*50 + 3*10 - 2*10

50 are sold, 50 are produced, 10 sales are lost, no units are salvaged. Answer is B

52. Using the data of Question 51, Find the profit (π) when 60 units are produced and the state of nature is a demand of 50 units. Do not include fixed costs.

a. π = 35*60 - 8*60 + 3*10
b. π = 35*50 - 8*50 - 2*10
c. π = 35*50 - 8*60 + 3*10
d, π = 35*60 - 8*50 + 3*10 - 2*10
e. π = 35*50 - 8*50 + 3*10 - 2*10

50 are sold, 60 are produced, no sales are lost, 10 units are salvaged. Answer is C

53. A club has 15 members. Each month, the number of new members joining the club follows the first probability distribution shown at left. The number of old members leaving the club follows the second probability distribution shown at right.

New members Joining	**Probability**	Lower bound	Upper Bound
7	.20	0.00	.20
8	.30	.20	.50
9	.30	.50	.80
10	.20	.80	1.00

Old members leaving	**Probability**	Lower bound	Upper Bound
6	0.10	0.00	.010
7	0.55	0.10	0.65
8	0.25	0.65	0.90
9	0.10	0.90	1.00

Simulate three months changes in club membership. Use the following random numbers for new members joining: 52, 06, 28, and for old members leaving: 53, 88, 47.

Month		Random #	Joining	Random #	Leaving	Membership at end of month
Membership at start of month						**15**
month 1	15	.52	9	.53	7	17
month 2	17	.06	7	.88	8	16
month 3	16	.28	8	.47	7	17

How many members are in the club at the end of month 3?

a. 13
b. 14
c. 15
d. 16
e. 17

Answer = E