

MATH/STAT 170 Final B

Last Name: _____

First Name: _____

Student ID: _____

We grade the work—not the answer. A correct answer with no supporting work is worth nothing. Use the back of the page if you need more room.

- 1) On January 1, 2012, I took out a \$40,000 student loan at 5% interest compounded monthly. I will make my first payment of \$300 on January 1, 2017. Thereafter, I pay \$300 per month at the beginning of the month .
- a. How much do I owe on January 1, 2017? Note: Even though I am not making payments between January 1, 2012 and January 1, 2017, the amount I owe increases over this period due to interest. *7 pts*

b. How much do I owe after my 100th payment? *5 pt*

- 2) I wish to buy a \$1,000,000 house. What will be the monthly payments on a 40 year loan at 3% interest, compounded monthly? Assume that all payments are made at the beginning of the month. *7 pts*

- 3) On January . 1, 2012, I won an award that pays X dollars every year for 20 years with the first payment immediately. At 5% annual interest, the present value of my award on January . 1, 2012 was \$5,000,000. Find X . *7 pts*

- 4) What price should you pay for a \$10,000 face value, 5 year bond, which has \$200 coupons, paid four times a year, assuming that you want a 4% yield, compounded 4 times a year? . 7 pts

Remark: What we have been referring to as "Face Value" in this class is more accurately called "Redemption Value."

5) Define

a. Insurable interest requirement . *3 pts*

b. Retrocession. *3 pts*

c. Sub-standard risk. *3 pts*

d. Anti-selection. *3 pts*

- 6) Distinguish between a valued contract and a contract of indemnity in the context of insurance. Give an example of each.. *4 pts*

7) A home owner' policy generally consists of two major sections, the first labeled A-D and a second part. My house was in a hail storm. I am fully insured.

a. What part pays for the damage to my roof? *3 pts*

b. What part pays for damage to my tool shed, which is not attached to the house? *3 pts*

c. The roof leaked causing damage to my \$10,000 home entertainment center. According to the doctrine of proximate cause, what is required for me to be paid for the damage to my home entertainment center? Be specific! *3 pts*

d. I decide to sue the roof installers for damages. The insurance company tells me that they will sue them for me. What is the process of them taking over the law suit called? *3 pts*

e. I had to stay in a hotel while my house was being repaired. Is this covered by my insurance? If so, which part? *3 pts*

f. Under what circumstances would Part II of my policy be used in the context of this claim? *3 pts*

8) Tam works at Sky High Construction doing steel work. He fell off of the top of a building Sky High was building and was seriously injured. Tam has submitted a claim for his medical benefits to Sky High under Workman's Compensation.

a. It turns out that Tam was high on drugs at the time. This almost certainly was the cause of the accident. Sky High has refused his claim because of this. In terms of current law, who is correct? Why? *3 pts*

b. Sky High also claims that Tam understood the dangers of “high steel” work and was informed that it is their policy not to pay full damages for such workers since they already get paid a higher salary than other workers. In terms of current law, who is correct? Why? *3 pts*

9) My house is currently worth \$400,000 but I only have it insured for \$300,000, with no deductible. My insurance company requires X% coinsurance. I had \$60,000 fire damage for which the insurance company paid \$55,000. Find X.
7 pts

10) Susan has a \$300,000 fully insured house with a disappearing deductible. For losses of \$1000 or less, the insurance company pays nothing while for losses \$3,000 or more they pay everything. What would Susan have to pay for a \$2,500 loss? *7 pts*

- 11) Below you are given a table of losses evaluated at 1/1/2012 for Klunker Auto Insurance. Assume all losses are fully developed at 48 months. Fill in the corresponding paid loss development factors in the second table. Give answer accurate to at least two digits after the decimal. *7 pts*

Loss Reserves

Accident Year	Cumulative Paid Losses			
	Development Stage in Months			
	12	24	36	48
2008	2,000	2,600	3,120	3,432
2009	3,000	3,600	3,960	
2010	2,500	3,000		
2011	1,000			

Development Stage in Months Paid Loss Development Factors

Accident Year	Cumulative Paid Losses		
	Development Stage in Months		
	12-24	24-36	36-48
2008			
2009			
2010			
2011			

12) Based on the data in problem 15, Klunker's actuaries decided to use the loss development factors given below. What would their estimated reserves be for each of 2008, 2009, 2010, and 2011? *6 pt*

Selected Loss Development Factors

12-24	24-36	36-48	48-Ult.
1.1	1.3	1.2	1

2008 Reserve = _____

2009 Reserve = _____

2010 Reserve = _____

2011 Reserve = _____