

MATH/STAT 170 Final B

Last Name: _____

First Name: _____

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) I buy a \$500,000, house with a 30 year loan at 3.3% interest **compounded monthly**. My monthly payments, paid at the beginning of each month, begin immediately. The bank says that my monthly payments should be \$2,183.77. I actually pay \$2,500 per month, paid at the beginning of each month. How many months does it actually take for me to pay off my house? (7 pts.)

- 2) Let information be as in Problem 1. After 15 years of payments, your wealthy uncle dies leaving you a fortune. You decide to pay off your mortgage. How much will you need to pay the bank? Assume that you pay off the house immediately after the 180th payment. (7 pts.)

- 3) I won a prize that promises to pay \$P at the beginning of the year for 30 years beginning on Jan. 1, 2015. Find P, given that the present value of my prize at 4.5% interest is \$1,000,000 on Jan. 1, 2015. (7 pts.)

- 4) Beginning in year 2000, I began depositing \$5000 per year at the end of each year into a retirement account that was earning 3.6% per year. However, after 10 deposits, I was forced to reduce my deposits to \$4000 per year. What will be the total accumulation in my account on Dec. 31, 2014, immediately after my 15th deposit? (7 pts.)

5) Define

a. Insurable interest requirement (5 pts.)

b. Valued Contract (5 pts.)

c. HMO (5 pts.)

d. Antiselection (5pts.)

6) According to J&L what are two legal requirements that must be met for a fraternal benefit society to sell insurance? (5 pts.)

7) These questions consider workman's compensation insurance.

a. In the United States who pays the premiums? (3 pts.)

b. I am covered by workman's compensation. I have an accident that was determined to be 40% my fault and 60% my company's fault. What fraction of my hospital bills will workman's compensation pay? (3 pts.)

8) Richard has an accident and hits Mary's car. It is Richard's fault. Mary is fully insured. Richard only has liability insurance and the amount he has is less than his state requires. ***Assume the coverage is not in a no-fault state. Thus the state is a tort jurisdiction.***

a) Mary's daughter Jane, who was riding with her, has to be taken to the hospital and treated for her injuries. Which coverages could be used to pay Jane's medical expenses? Give as complete of an answer as possible. (3 pts.)

b) Richard also is injured and has to be treated at the hospital. Which coverages could be used to pay Richard's medical expenses? Give as complete of an answer as possible. (3 pts.)

c) Mary's car is damaged from the accident. Which coverages could be used to pay the damages to Mary's car? Give as complete of an answer as possible. (3 pts.)

9) Assume that in question 8) the state IS no-fault state. How would the answer to part c) change? Explain. (3 pts.)

10) A home owner' policy generally consists of two major sections, the first labeled A-D and a second part, labeled Part II. My house had a fire.

a. The fire damaged my neighbor's house. Does my insurance cover the damage to the neighbor's house? If so, which section/part of my policy? (3 pts.)

b. The fire caused the electricity to go out in the house which caused the food to spoil in my freezer. My claim to cover the food spoilage was denied by the insurance company due to the ***doctrine of proximate cause***. What does this tell you about the coverage of my homeowner's policy? Explain in terms of the doctrine of proximate cause. (3 pts.)

- c. It was determined that the fire was caused by a new heater I had just bought which was shown to have been poorly made by the Hades Heater Company. This resulted in a subrogation lawsuit. Explain this concept. Specifically, who is suing whom? If the lawsuit is successful, who gets paid? What, if any, is my role in this action? Why? (4 pts.)

11) My house is currently worth \$200,000. I have it insured for \$100,000. My insurance company requires 80% coinsurance. How much will the insurance company pay on a \$30,000 loss? (5 pts.)

12) I have a \$300,000 fully insured house with a linearly disappearing deductible. For losses of \$2000 or less, I pay everything while for losses \$5,000 or more I pay nothing. How much would I pay for a loss of \$4,500 ? (6 pts.)

- 13) Below you are given a table of losses evaluated at 1/1/2013 for No Go 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. (4 pts.)

Loss Reserves

Accident Year	Cumulative Paid Losses			
	Development Stage in Months			
	12	24	36	48
2010	2,000	2,600	3,120	3,744
2011	3,000	3,300	4,950	
2012	2,500	3,000		
2013	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
2010			
2011			
2012			
2013			

- 14) Based on the data in the preceding problem, No Go's actuaries decided to use the loss development factors given below. What would their estimated reserves be for each of 2010, 2011, 2012, and 2013? (4 pts.)

Selected Loss Development Factors

12-24	24-36	36-48	48-Ult.
1.1	1.2	1.4	1

2010 Reserve = _____

2011 Reserve = _____

2012 Reserve = _____

2013 Reserve = _____