

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) Upon graduation Sarah has \$40,000 in student loans at 7.5% interest, compounded monthly. How much does she still owe immediately after her 120th payment if she pays \$270 at the beginning of each month? (7 pts.)

- 2) Beginning in year 2000, I began depositing \$1000 per year at the end of each year into a retirement account that was earning 4.2% per year. (My first deposit was made on December 31, 2000.) In 2010 the interest rate dropped to 2%. What will be my balance after my deposit on December 31, 2015? (7 pts.)

- 3) I own a 30 year bond that pays \$200 coupons four times a year and has a \$5,000 redemption value. I sell it immediately after collecting the 40th coupon to an investor wanting a 4.3% yield, compounded quarterly. What price should I charge? (7 pts.)

4) Define

a. Endowment insurance (*3 pts.*)

b. Mutual insurance company. (*3 pts.*)

c. Morbidity table (*3 pts.*)

d. Cede (in the context of insurance) (*3pts.*)

e. Moral hazard (3pts.)

- 5) Jones Software Company wanted to buy an insurance policy on an artist who does contract work for them. Their request was originally denied by Penney Insurance on the basis of the Insurable Interest Requirement. Jones appealed and was eventually allowed to buy the insurance. Explain. Specifically, what is the Insurable Interest Requirement? Why might Penney Insurance have initially refused to sell the insurance? On what basis might Jones have appealed? (6 pts.)

6) I work in a steel foundry. While at work I was run over by a truck, resulting in my being permanently crippled.

a. Name three benefits that I can expect to receive from Work Man's Compensation. (3pts.)

b. The insurance company refuses to pay, pointing out that when I took the job, I signed a waiver stating that I was aware of the dangers of the work and would not hold the foundry responsible for any on the job accidents. They also said that the accident was the fault of the driver of the truck. I sue them. Should I win? Explain in terms of current law. (5pts.)

7) While Richard was stopped for a stop light, John hit Richard's car from behind. It is John's fault. Both Richard and John are fully insured. *Assume the coverage is in a no-fault state.*

a) What coverage in whose insurance policy would pay for the damages to Richard's car? (3 pts.)

b) What coverage in whose insurance policy would pay for the damages to John's car?(3pts.)

c) Richard was injured in the accident. What coverage in whose insurance policy would pay for Richard's medical expenses?(3pts.)

d) John's son who was riding with John was also injured. What coverage in whose insurance policy would pay for the son's medical expenses?(3pts.)

8) Suppose that the accident described in problem 7) had occurred in a *tort state*. Which of the answers to parts a)-d) would change? How would they change?(4pts.)

9) A home owner' policy generally consists of two major parts, Section I and Section II. Section I is subdivided into parts labeled A-D. I had a disaster in my home. For each of the following losses explain which part, if any, would pay for the loss.

a. My tool shed, which is not attached to my house, was destroyed by a fire.
(3pts.)

b. The fire spread to the house, damaging the south wall.(3pts.)

c. The fire destroyed my new TV.(3pts.)

d. The fire spread to my neighbor's house, causing considerable damage.(3pts.)

e. The fire was caused by faulty wiring in my air conditioner that was manufactured by Blow Hard Air. This caused a subrogation law suit. Who is suing whom? If the suit is successful what, if anything, might I gain from the suit? (4pts.)

10) My house is currently worth \$300,000. I had a \$50,000 loss for which the insurance company paid \$40,000. There was no deductible, but the insurance company has a 75% co-insurance requirement. How much did I have the house insured for? (5 pts.)

11) I have a \$200,000 fully insured house with a linearly disappearing deductible. For losses of \$2,000 or less, I pay everything while for losses of \$5,000 or more I pay nothing. How much would the insurance pay on a loss of \$3,000? (5 pts.)

12) Below you are given a table of losses evaluated at 1/1/2014 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
2011	2,200	3,080	3,696	4,805
2012	1,000	1,200	1,800	
2013	3,000	3,900		
2014	2,000			

Development Stage in Months Paid Loss Development Factors

Accident Year	Cumulative Paid Losses		
	Development Stage in Months		
	12-24	24-36	36-48
2011			
2012			
2013			
2014			

13) 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 2011, 2012, 2013, and 2014? (4 pts.)

Selected Loss Development Factors

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

2011 Reserve = _____

2012 Reserve = _____

2013 Reserve = _____

2014 Reserve = _____