13. (3.25 points)

An actuary prices two loss-sensitive options for a workers compensation policy as follows:

Option 1: A large deductible plan with a per-occurrence deductible of $50,000

Option 2: An incurred retrospective rating plan with the following parameters:

Per Occurrence Limit	$50,000
Basic Premium	$150,000
Tax Multiplier	1.045
Loss Conversion Factor	1.100
Deposit Premium (paid at policy inception)	$1,000,000

For each of the options above, assume that no aggregate limits or maximum premiums apply and that the first adjustment will take place 18 months after policy inception.

Additionally, the actuary has developed the following assumptions for the insured:

	Unlimited	Limited to $50,000
Expected Loss	$650,000	$435,000
18-Ultimate Incurred LDF	4.25	3.75
18-Ultimate Paid LDF	8.80	6.55

a. (2.25 points)

For each of the plans above, determine the expected cash flows between the insured and insurer 18 months after policy inception.

b. (1 point)

The insured is contemplating a third option of purchasing an excess policy with a self-insured retention of $50,000.

i. Which of the three options would be least attractive to the insurer if they wish to minimize credit risk? Briefly explain your choice.

ii. Which of the three options would be least attractive to the insurer if they wish to minimize interest rate risk? Briefly explain your choice.

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- A common mistake was identifying the experience rating plan as the better way to correct premium inadequacy.

QUESTION 13
Total Point Value: 3.25 **Learning Objectives: B6, B7**
Sample Answers
Part a: 2.25 points

LDD:

Sample 1
At 18 months, 435,000/6.55 = 66,412 of loss below the deductible is expected to have been paid.
Insured owes the insurer $66,412 as reimbursement.

Retro Policy:

Sample 1
The retro premium formula is R = (b + CL + cF)T.
F is the expected excess loss, which in this case is 650,000 - 435,000 = 215,000.
At 18 months, 435,000/3.75 = $116,000 of loss below the retro limit is expected to have been incurred.
R = (150,000 + (1.1)(116,000) + (1.1)(215,000))(1.045) = 537,235
Insured has already paid $1M in deposit premium, so the insurer owes the insured $462,766.

Sample 2
The retro premium formula is R = (b + CL + cF + cV)T.
F is the expected excess loss, which in this case is 650,000 - 435,000 = 215,000.
At 18 months, 435,000/3.75 = $116,000 of loss below the retro limit is expected to have been incurred.
Assume the insured elects to include V, the retro development. V = 435,000(1 – 1/3.75) = 319,000
R = (150,000 + (1.1)(116,000) + (1.1)(215,000) + (1.1)(319,000))=903,925
Insured has already paid $1M in deposit premium, so the insurer owes the insured $96,075.

Part b: 1.0 points
Sample 1

i. LDD is least attractive and would be most subject to credit risk, since the insurer pays all claims upfront, and then needs to recover loss amounts below the deductible from the insured. There's a chance the insured won't or can't pay.
ii. Excess policy is least attractive and would be most subject to interest rate risk because it has the longest payout period.

Examiners Report
Part a: Generally, candidates struggled with both the LDD and Retrospective cash flow calculation. Common errors for LDD were ignoring the deductible reimbursement as a portion of the cash flow and attempting to calculate the premium. Candidates should remember that workers compensation payments go directly to claimants and not the insured, thus it was not necessary for candidates to calculate claim payments made by the insurer.

Common errors for the Retro were not including the excess loss provision in the calculation and using incurred losses at ultimate as opposed to including the 18 month valuation. In some cases candidates tried to use the 1,000,000 deposit premium as the standard premium. The amount of standard premium was not required for this problem.

The provision for retro development in retro policies is an optional provision that insureds elect into. For this reason, candidates were not expected to include the development factor in their calculation. For candidates that included a provision for development in their retro premium calculation, they needed to explicitly state their assumption in order to receive full credit.

The Expected losses were supposed to be interpreted as ultimate values and candidates should've been able to recognize that. However, candidates had the potential to receive full credit if they treated the expected limited losses of 435,000 as an 18 month valuation.

Part b: Candidates generally scored well on this question, with a majority receiving full credit. In order to receive full credit on the question, candidates needed to detail which of the options were least attractive and support their choice. The most common error was detailing which plan was most attractive without giving indication to which was least attractive.