14. (4.25 points)

The following information is available for a property and casualty insurance company as at December 31, 2016. All amounts are in thousands of dollars ($000s).

Cumulative Gross Paid Losses			
Accident Year	Months of Development		
	12	24	36
2014	40,000	60,000	75,000
2015	35,000	50,000	
2016	39,000		

Total Gross Unpaid Claims			
Accident Year	Months of Development		
	12	24	36
2014	39,000	20,000	0
2015	40,000	16,000	
2016	41,000		

The cumulative accident year payment pattern is as follows:

Age (months)	Cumulative Percentage Paid
12	50%
24	75%
36	100%

	2016	2015
Gross unearned premium	90,000	80,000
Gross premium written	100,000	n/a
Discount rate	3%	3%
Margin for adverse deviations (MfAD) for claims development	10%	10%
MfAD for recovery from reinsurance ceded	1%	1%
MfAD for investment return rates	0.25%	0.25%
Net claim liabilities	?	47,876
Premium taxes, net commissions and general expenses	15,000	15,000
Interest income from investments	100	125
Realized gains (losses) from Fair Value Option assets	200	225
Unrealized gains (loss) from Fair Value Option assets	250	275
Realized gains (losses) from Available For Sale assets	300	325
Unrealized gains (losses) from Available For Sale assets	350	375
Realized gains (losses) from Held to Maturity assets	400	425
Unrealized gains (losses) from Held to Maturity assets	450	475
Investment expenses	50	50

- Since its inception, the company has had a quota share treaty with a 25% cession rate. There is no other reinsurance.
- Assume that there are no income taxes and no premium deficiency.

<< QUESTION 14 CONTINUED ON NEXT PAGE >>

a. (3.75 points)

Calculate the company's net income and total comprehensive income for 2016.

b. (0.5 point)

Contrast the use of fair value and historical cost to value an asset.

CONTINUED ON NEXT PAGE

QUESTION 14	
TOTAL POINT VALUE: 4.25	**LEARNING OBJECTIVE(S): C1**
SAMPLE ANSWERS	

Part a: 3.75 points

Note that for this question we accepted both discounting at mid-year or at year-end.

Sample 1

Assuming mid-year payments

Net Earned Premium = (100,000 + 80,000 - 90,000) x 75% = 67,500

Discount factors at 3%:
AY 2015 = (1-0.75)/(1-0.75)*1.03^-0.5 = 0.9853
AY 2016 = (0.75-0.5)/(1-0.5)*1.03^-0.5 + (1-0.75)/(1-0.5)*1.03^-1.5 = 0.9710

Discount factors at 2.75%:
AY 2015 = (1-0.75)/(1-0.75)*1.0275^-0.5 = 0.9865
AY 2016 = (0.75-0.5)/(1-0.5)*1.0275^-0.5 + (1-0.75)/(1-0.5)*1.0275^-1.5 = 0.9733

Gross discounted at 3% = 16,000 * 0.9853 + 41,000 * 0.9710 = 55,576
Net discounted at 3% = 55,576 * 0.75 = 41,682

Net PFAD claims = 10% * 41,682 = 4,168
Net PFAD interest rate = (16,000 * 0.9865 + 41,000 * 0.9733)*0.75 – 41,682 = 85
Net PFAD reinsurance = (55,576 – 41,682) * 1% = 139
Net APV claim liabilities = 41,682 + 4,168 + 85 + 139 = 46,074

Net paid claims = [(39,000 + 50,000 + 75,000) – (35,000 + 60,000)] * 0.75 = 69,000 * 0.75 = 51,750
Net incurred losses = 51,750 + 46,074 – 47,876 = 49,948

Net Investment Income: 100 + 200 + 250 + 300 + 400 – 50 = 1,200
Other Comprehensive Income (OCI): 350

Net income for 2016 = EP – Incurred – Expenses + Investment Income = 67,500 – 49,948 – 15,000 + 1,200 = 3,752

Total comprehensive income for 2016 = Net income + OCI = 3,752 + 350 = 4,102

Sample 2

Assuming mid-year payments

Net Earned Premium = (100,000 + 80,000 - 90,000) x 75% = 67,500

Projection of future payments:
AY 2015 in CY 2017 = 16,000 ((1-0.75)/(1-0.75) = 16,000

AY 2016 in CY 2017 = 41,000 ((0.75-0.5)/(1-0.5)) = 20,500
AY 2016 in CY 2018 = 41,000 ((1-0.75)/(1-0.5)) = 20,500

Discounted Payment @3%:
16,000*1.03^-0.5 +20,500 *1.03^-0.5 + 20,500 *1.03^-1.5 = 55,576

Discounted Payment @2.75%:
16,000*1.0275^-0.5 +20,500 *1.0275^-0.5 + 20,500 *1.0275^-1.5 = 55,691

Net discounted at 3% = 55,576 * 0.75 = 41,682
Net discounted at 2.75% = 55,691 * 0.75 = 41,768

Net PFAD claims = 10% * 41,682 = 4,168
Net PFAD interest rate = (41768– 41,682) = 86
Net PFAD reinsurance = (55,576 – 41,682) * 1% = 139
Net APV claim liabilities = 41,682 + 4,168 + 86 + 139 = 46,075

Net paid claims = [(39,000 + 50,000 + 75,000) – (35,000 + 60,000)] * 0.75 = 69,000 * 0.75 = 51,750
Net incurred losses = 51,750 + 46,075 – 47,876 = 49,949

Net Investment Income: 100 + 200 + 250 + 300 + 400 – 50 = 1,200
Other Comprehensive Income (OCI): 350

Net income for 2016 = EP – Incurred – Expenses + Investment Income = 67,500 – 49,949 – 15,000 + 1,200 = 3,751

Total comprehensive income for 2016 = Net income + OCI = 3,751 + 350 = 4,101

Sample 3
Assuming End of year payments

Net Earned Premium = (100,000 + 80,000 - 90,000) x 75% = 67,500

Discount factors at 3%:
AY 2015 = (1-0.75)/(1-0.75)*1.03^-1 = 0.9709
AY 2016 = (0.75-0.5)/(1-0.5)*1.03^-1 + (1-0.75)/(1-0.5)*1.03^-2 = 0.9567

Discount factors at 2.75%:
AY 2015 = (1-0.75)/(1-0.75)*1.0275^-1 = 0.9732
AY 2016 = (0.75-0.5)/(1-0.5)*1.0275^-1 + (1-0.75)/(1-0.5)*1.0275^-2 = 0.9602

Gross discounted at 3% = 16,000 * 0.9709 + 41,000 * 0.9567 = 54,760
Net discounted at 3% = 54,760 * 0.75 = 41,070

Net PFAD claims = 10% * 41,070 = 4,107
Net PFAD interest rate = (16,000 * 0.9732 + 41,000 * 0.9602)*0.75 – 41,070 = 135

Net PFAD reinsurance = (54,760 – 41,070) * 1% = 137
Net claim liabilities = 41,070 + 4,107 + 135, +137 = 45,449

Net paid claims = [(39,000 + 50,000 + 75,000) – (35,000 + 60,000)] * 0.75 = 69,000 * 0.75 = 51,750

Net incurred losses = 51,750 + 45,449 – 47,876 = 49,323

Net Investment income: 100 + 200 + 250 + 300 + 400 – 50 = 1,200
Other Comprehensive Income (OCI): 350

Net income for 2016 = EP – Incurred – Expenses + Investment Income = 67,500 – 49,323 – 15,000 + 1,200 = 4,377

Total comprehensive income for 2016 = Net income + OCI = 4,377 + 350 = 4,727

Sample 4
Assuming End of year payments

Net Earned Premium = (100,000 + 80,000 - 90,000) x 75% = 67,500

Projection of future payments:
AY 2015 in CY 2017 = 16,000 ((1-0.75)/(1-0.75) = 16,000
AY 2016 in CY 2017 = 41,000 ((0.75-0.5)/(1-0.5)) = 20,500
AY 2016 in CY 2018 = 41,000 ((1-0.75)/(1-0.5)) = 20,500

Discounted Payment @3%:
16,000*1.03^-1 +20,500 *1.03^-1 + 20,500 *1.03^-2 = 54,760

Discounted Payment @2.75%:
16,000*1.0275^-1 +20,500 *1.0275^-1 + 20,500 *1.0275^-2 = 54,940

Net discounted at 3% = 54,760 * 0.75 = 41,070
Net discounted at 2.75% = 54,940 * 0.75 = 41,205

Net PFAD claims = 10% * 41,070 = 4,107
Net PFAD interest rate = 41205 – 41,070 = 135
Net PFAD reinsurance = (54,760 – 41,070) * 1% = 137
Net claim liabilities = 41,070 + 4,107 + 135, +137 = 45,449

Net paid claims = [(39,000 + 50,000 + 75,000) – (35,000 + 60,000)] * 0.75 = 69,000 * 0.75 = 51,750

Net incurred losses = 51,750 + 45,449 – 47,876 = 49,323

Net Investment income: 100 + 200 + 250 + 300 + 400 – 50 = 1,200
Other Comprehensive Income (OCI): 350

Net income for 2016 = EP – Incurred – Expenses + Investment Income = 67,500 – 49,323 – 15,000 + 1,200 = 4,377

Total comprehensive income for 2016 = Net income + OCI = 4,377 + 350 = 4,727

Part b: 0.5 point

Sample 1

Recording an asset or liability at fair value means recording it at a value that it would be bought or sold for in the open market. Recording at historical cost means evaluating an asset at the original purchase price less depreciation.

Sample 2

There is a trade-off between the reliability of the historical cost method (in that it is objectively verifiable) and accuracy of the fair value approach (in that it is more consistent with the actual market value).

EXAMINER'S REPORT

The candidate is expected to be able to calculate net income and total comprehensive income from their component parts and calculate the other needed items such as earned premium, net incurred losses, and net investment income.

The candidate is expected to be able to differentiate between fair value and historical value of assets.

Part a

For subpart a., provide commentary on the following:

- To achieve full credit the candidate was expected to convert the unpaid claims triangles, discount them, apply the PfADs, calculate net incurred losses, earned premium, and net income. Given a portfolio of assets (AFS, HTM, HFT) the candidate was expected to understand how the different types of assets flow through to the income statement and be able to calculate the total comprehensive income.

Common mistakes include:

- Not applying the reinsurance on the earned premiums, or the discounted unpaid claims
- Future payments were calculated incorrectly, or based on the paid triangle and not on the unpaid triangle
- Discount factors or discounted future payments were calculated incorrectly
- Net paid claims were not calculated
- Candidates used the APV unpaid losses in the net income calculation and did not calculate the net incurred loss
- Net investment income and Other Comprehensive income were incorrect

Part b

Candidates were expected to contrast fair value against historical cost by providing one item for each.

A common mistake includes:

- Not listing one item for each fair value and historical cost