20. (2.50 points)

A property and casualty insurance company's bond portfolio as at December 31, 2014 is as follows:

Bond	Market Value	Coupon Rate	Yield to Maturity	Maturity	Duration
A	$1,014,000	5.00%	2.25%	2015-06-30	0.500
B	$1,006,000	3.00%	2.40%	2015-12-31	0.993
C	$986,000	1.50%	2.45%	2016-06-30	1.489

The actuary has calculated the following net undiscounted provisions as at December 31, 2014:

Accident Year	Undiscounted Case Reserves	Undiscounted IBNR
2013	$500,000	$250,000
2014	$1,500,000	$675,000
Total	$2,000,000	$925,000

a. (0.5 points)

Calculate the rate used to discount claim liabilities at December 31, 2014.

b. (0.75 points)

If the undiscounted unpaid liabilities totaled $5 million, discuss whether the discount rate calculated in part a. above is appropriate.

c. (1.25 points)

Identify five considerations used in determining the expected investment return rate for the calculation of present value.

CONTINUED ON NEXT PAGE

QUESTION *20*	
TOTAL POINT VALUE: *2.50*	**LEARNING OBJECTIVE: *C1***
SAMPLE ANSWERS (BY PART, AS APPLICABLE)	
Part a: *0.50* point	

$$\frac{MV_1 \times YTM_1 \times Duration_1 + MV_2 \times YTM_2 \times Duration_2 + MV_3 \times YTM_3 \times Duration_3}{MV_1 \times Duration_1 + MV_2 \times Duration_2 + MV_3 \times Duration_3} = 2.40\%$$

$$\frac{1{,}014{,}000 \times 2.25\% \times 0.50 + 1{,}006{,}000 \times 2.40\% \times 0.993 + 986{,}000 \times 2.45\% \times 1.489}{1{,}014{,}000 \times 0.50 + 1{,}006{,}000 \times 0.993 + 986{,}000 \times 1.489}$$
$$= 2.40\%$$

Part b: *0.75* point

It is not appropriate (because the assets would not support liabilities)

Need to consider other assets or sources of revenue to back up the liabilities

A new discount rate would be calculated considering the different yield of those other assets / sources of revenue

Part c: *1.25* point

Any five of the following earned full credit:

1. The method of valuing assets and reporting investment income / method of valuation
2. The allocation of those assets and that income among lines of business
3. The return (rate of return) on the assets at the balance sheet date
4. The yield on assets acquired after the balance sheet date
5. Reinvestment rates / reinvestment risk / new money rate
6. The capital gains and losses on assets sold after the balance sheet date / capital gains and losses after the calculation date
7. Capital gain and loss arising from premature liquidation
8. Investment expenses / transaction costs
9. Losses from default / quality of investments (assets) / credit risk of investment / volatility of the investments
10. Liquidity risk (of assets)
11. Market risk / changes in the yield curve / foreign exchange rate
12. Company investment strategy / philosophy / mix of investment types
13. Duration or maturity of assets / Cashflow mismatch / Timing risk
14. Reinvestment rates / reinvestment risk / new money rate

EXAMINER'S REPORT (BY PART, AS APPLICABLE)

Part a

Most candidates were able to compute the discount rate from the information provided. Common errors included

- not using the weighting with the duration
- using the coupon rate instead of the yield to maturity.

Part b
Most candidates recognized that the discount rate in part a would be inadequate and mentioned the need to consider other assets or sources of revenues. A common error was to neglect to mention the effect on a new discount rate.
Part c
A list from the SOP was present in three of the reference texts but candidates were not limited to that list as long as they provided reasonable considerations.