

ADDENDUM EXAM 6-U.S.
SAMPLE ANSWERS AND EXAMINER'S REPORT
SPRING 2014

Occasionally, through candidate feedback, we find that improvements or additions can be made to a previously published Examiner's Report. This addendum to the 2014 spring 2014 Exam 6-U.S. Examiners' Report contains additional insights into Question 18 and we hope that it will further assist candidates in their exam preparations. Note that the release of this addendum does not reopen the appeals window for this exam.

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QUESTION 18																																																																																									
TOTAL POINT VALUE: 6	<ul style="list-style-type: none"> - LEARNING OBJECTIVE: - Syllabus Section C2 <ul style="list-style-type: none"> o LO: Using RBC Formulas and IRIS ratios, evaluate an insurer's financial health <ul style="list-style-type: none"> ▪ KS A: RBC formula ▪ KS B: Components of RBC - Syllabus Section C4 <ul style="list-style-type: none"> o LO: Calculate specific elements of income tax and evaluate their implications for a property/casualty insurer <ul style="list-style-type: none"> ▪ KS A: Discounting ▪ KS B: Elements of income tax calculation ▪ KS C: Statutory book income vs. taxable income ▪ Alternative minimum ▪ Deferred Tax Asset and Deferred Tax Liability ▪ Temporary vs. permanent differences 																																																																																								
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Sample #2

	.3(AMTI) = .35 (RTI)	Assume x = % muni		
	AMTI = 1.167 (RTI)	1-x = % corp		
		SAP UW Inc	proration provision for tax exempt	
		←	←	
	RTI = 5 + .2 ΔUEPR + chng discount + .15(.04)(x)(1500) + .09(1-x)(1500)			
				←
				corp bonds (not tax exempt)
	= 5 + .2(500-490) + 10 + 9x + 135 - 135x			
	RTI = 152 - 126x			
	AMTI = RTI + .75(amount exempt from tax)			
	= 152 - 126x + .75 (.85(.04)(x)(1500)) = 152 - 126x + 38.25x - 87.75x			
	Max net income => .3 (152 - 87.75x) = .35(152 - 126x)			
	45.6 - 26.325x = 53.2 - 44.1x			
	17.775x = 7.6			
	x = .4275			
	*1500 ----> 641.35M to muni bonds			
				858.65 ----> corporate

Sample #3

Say insurer invests (X) amounts in muni bond	
Investment in corporate bond = (1500 - X)	
RTI = 5 + .2 (500 - 490) + (1500 - X)(.09) + (X)(.04)(.15) + 10	
= 17 + 135 - .09X + .006X	
= 152 - .084X	
AMTI = 152 - .084X + .75(.85 * .04(X))	
= 152 - .084X + .0255X	
= 152 - .0585X	
To optimize tax: (.30) AMTI = .35 (RTI)	
.3 (152 - .0585X) = .35 (152 - .084X)	
45.6 - .01755X = 53.2 - .0294X	
Allocated to municipal (X) = 6441.35M #	

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Sample #4

	<u>100% to Corporate</u>	<u>X% Municipal</u>
<u>Regular Taxable Income (RTI):</u>		
Statutory Underwriting Income	= 5	= 5
Change in UPR (20% Δ UPR)	= $0.2 \times (500 - 490) = 2$	= $0.2 \times (500 - 490) = 2$
Change in loss reserve discount	= 10	= 10
Yield on bonds	= $.09 \times 1 \times 1500 = 135$	= $135(1-x) + 60x$
RTI	= $5 + 2 + 10 + 135 = 152$	= $17 + 135(1-x) + 60x(.15) = 152 - 135x + 9x = 152 - 126x$
Regular Income Tax	= $152 \times .35 = 53.2$	= $(152 - 126x) \times .35$
<u>Alternative Min Taxable Income (AMTI):</u>		
AMTI	= 152	= $152 - 126x + (.75 \times .85 \times .04 \times 1500x) = 152 - 126x + 38.25x = 152 - 87.75x$
Alternative Income Tax	= $152 \times .3 = 45.6$	= $(152 - 87.75x) \times .3$
<u>Allocation:</u>		
	100%	$(152 - 126x) \times .35 = (152 - 87.75x) \times .3$
		$53.1 - 44.1x = 45.6 - 26.325x$
		$53.2 - 44.1x = 45.6 - 26.325x$
		$7.6 = 17.775x$
		$x = .4275$
		\$ municipal = 641.35; \$ corporate = 858.65
<u>Tax:</u>		
	= 53.2	= 34.34725
<u>After tax net income:</u>		
	= $17 + 135 - 53.2 = 98.8$	= $17 + 102.9375 - 34.725 = 85.59025$

As shown above, because the after-tax income gained from investing 100% in corporate bonds is greater than the optimal mix of corporate and municipal bonds, invest 100% in corporate bonds.

Part b: 3.25 points

Sample #1

muni bonds charge $641.35 \times .02 = 12.827$					
corp bonds charge $(1500 - 641.35) \times .10 = 85.865$					
$R1 = 12.827 + 85.865 = 98.692$					
$R0 = 50$					
$R2 = 50 \times .15 = 7.5$					
$R3 = .1 \times (15 - 1.5) = 1.35 \times 1/2 = .675$					
$R4 = 100 + 1/2 \times (.1 \times (15 - 1.5)) = 100.675$					
$R5 = 130$					
2012 RBC requirement = $50 + (98.692^2 + 7.5^2 + .675^2 + 100.675^2 + 130^2)^{1/2} = 241.917$					
RBC ratio (using 30% AMTI tax rate) = $(235 - 2) / (241.917 \times .5) = 193\% < 200\%$					
Using 20% tax rate, RBC ratio is 211% > 200%, there is no action level.					
Using 30% tax rate, RBC ratio drops to 193%, which is company action level.					
Company needs to submit a plan to regulator about how to increase surplus or reduce risk; no action from regulators.					

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Sample #2

$R1 = 2\% * (641.35) + 10\% (1500 - 641.35) = 98.692$	$RBC = R0 + (R1^2 + R2^2 + \dots)^{1/2} = 241.92$
$R2 = 15\% * 50 = 7.50$	
$R3 = (15 - 1.5) * 10\% = 1.35 \rightarrow \div 2 = .675$	adj PHS = 235 - 2 = 233
rsv > reins recov --> split	
$R4 = 100 + 0.675 = 100.675$	RBC ratio = $233 / (241.92 / 2) = 192.6\%$
RBC ratio falls into "company action level range" (150-200%) so company must submit a plan on how it will increase surplus or reduce risk	

Sample #3

Calculation of RBC ratio using allocation of 100% to corporate bonds (0% to municipal bonds)

	0% to Municipals
R0	50.00
R1	150.00
R2	7.50
R3	0.68
R4	100.68
R5	130.00
RBC	272.69
Adj PHS	233.00
RBC ratio	171%

Part c: 0.5 point

Sample #1

Maximize tax advantage but add stipulation to keep RBC > 200% by incorporating RBC charge in calculation.

Sample #2

Use a bond portfolio that will maximize your net income while maintaining RBC % levels above 200%.

Sample #3

Allocate for maximum net income, but stay above 200% RBC ratio.

Sample #4

Optimal allocation is one that makes AMIT = RIT, but also want to optimize so don't get RBC ratio below 200%. So need to use latter as constraint.

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EXAMINER'S REPORT

Part a

The question required the candidate to calculate the RIT and AMIT at the new 2012 AMIT rate. Further the question required the candidate to know that in order to determine the optimal bond allocation they should set $AMIT = RIT$.

Full credit was given for

- calculating all of the components of RTI and assembling correctly
- applying the appropriate RIT rate
- determining the AMIT calculation
- applying the new 30% AMIT rate
- setting these two tax amounts equal

Most candidates were able to demonstrate that they knew AMIT must equal RIT in order to optimize bond allocation, i.e. maximize net income/minimize tax

Common mistakes:

- Candidates included common stock in investment income. Common stocks are not taxable, only their dividends are. The problem specifically notes that the stock was not dividend bearing in RTI.
- Candidates neglected to include or miscalculated the change in unearned premium reserve
- Candidates incorporated only the bond without including the remaining components of taxable income.
- When setting up their RTI formula candidates subtracted the pro-rated portion of bond income without first including the full amount of bond income.
- In RTI, candidates subtracted change in loss reserve discount instead of adding.
- Candidates used the prior AMIT rate of 20%.

Part b

Incorporating the bond allocation from Subpart A, candidates were required to calculate the various components of RBC charge and ultimately calculate the RBC ratio for the company after the revised AMIT tax rate. Candidates then needed to identify the RBC Action Level and explain what action was required.

Most candidates were able to demonstrate knowledge of the RBC charge square root formula and the RBC ratio formula.

Common mistakes:

- For R3, it was necessary to adjust for the provision of reinsurance. Some candidates did not adjust or adjusted incorrectly.
- Candidates set up the RBC charge correctly, but used the incorrect RBC charge rate in various components.
- To determine the RBC ratio candidates needed to adjust the Policyholder Surplus by subtracting the non-tabular discount. Some candidates either missed the adjustment or added the discount.
- Most candidates received credit when they identified the RBC action level and required action. Generally points were lost when candidates omitted this part of the question or just made some comments about the change over the prior calculated ratio from within the question.

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Part c

Full credit was given to candidates who indicated that the company needed to incorporate the optimal bond allocation determined in Subpart A (maximizing net income/minimizing taxes) while incorporating the criteria that the RBC ratio should not fall below the Company Action Level of 200%.

Partial credit was given to candidates who identified either maximizing net income/reducing taxes OR reducing RBC charge/increasing RBC ratio, but not both.