

**Reading:** Odomirok.19-RBC (RBC (Model - 2017.Spring Q19)) a-Question 2017.Spring Q19  
**Model:** 2017.Spring #19  
**Problem Type:** Calculating the RBC charges (not the ratio)

**Given**

item	RBC charge
Investment income due and accrued	1,000
Federal income tax recoverable	1,500
Recoverable from parent, subsidiaries, or affiliates	3,000
Reinsurance recoverable	4,000
Reserve	22,000
Written premium	17,000
Cash and cash equivalents	4,500
Unaffiliated bond	11,000
Unaffiliated stocks	8,500
Real estate	2,000
Asset concentration	5,500
Other non-insurance subsidiaries	8,000
Investments in insurance affiliates	500
Non-Tabular Discount	4,500
Tabular Discount in Reserves	2,500

**Find**

- RBC total risk charge
- range of surplus corresponding to RAL (*Regulatory Action Level*)

**Note**

This question was ambiguous and many different solutions were accepted. My answer corresponds to **Sample Answer 2** because that seemed the simplest. (*It might be helpful also to spend a moment looking over the answers in the examiner's report.*)

**Concept**

You just have to figure out which risk category each RBC charge goes into. Then apply the basic formula for the RBC charge.

**Concept**

It's straightforward except for 2 items:

- Reinsurance recoverable is split 50/50 between  $R_3$  and  $R_4$ .
- Asset concentration factor can be split in any proportion between  $R_1$  and  $R_2$ . (*I chose 100% for  $R_2$ .*)

**RBC Ratio**

You cannot calculate the RBC Ratio because they don't provide TAC (Total Adjusted Capital)

item	RBC charge	A	F	E	C	reserve	NWP
		R <sub>0</sub>	R <sub>1</sub>	R <sub>2</sub>	R <sub>3</sub>	R <sub>4</sub>	R <sub>5</sub>
Investment income due and accrued	1,000				1.0		
Federal income tax recoverable	1,500				1.0		
Recoverable from parent, subsidiaries, or affiliates	3,000				1.0		
Reinsurance recoverable	4,000				0.5	0.5	
Reserve	22,000					1.0	
Written premium	17,000						1.0
Cash and cash equivalents	4,500		1.0				
Unaffiliated bond	11,000		1.0				
Unaffiliated stocks	8,500			1.0			
Real estate	2,000			1.0			
Asset concentration	5,500			1.0			
Other non-insurance subsidiaries	8,000	1.0					
Investments in insurance affiliates	500	1.0					
reasoning from Sample 2 from examiner's report ==>		8,500	15,500	16,000	7,500	24,000	17,000

sum check: **88,500**sum check: **88,500**

difference: 0

$$\text{RBC charge} = R_0 + [R_1^2 + R_2^2 + R_3^2 + R_4^2 + R_5^2]^{0.5} = 46,150 \leq \text{final answer (part a)}$$

**(part b)**Let NTB = Non-Tabular Discount = **4,500** (given)Let TB = Tabular Discount = **2,500** (given)

## Required Facts:

\* RAL corresponds to a range of 100-150% for the RBC ratio

\* RBC Ratio = TAC / ACL = TAC / 23075 (ACL = 50% of the RBC charge from part a)

\* TAC = PHS - NTB - TB = PHS - 7000

Then

$$100\% = (PHS - 7000) / 23075 \Rightarrow PHS = 30,075 \leq \text{low end of range}$$

$$150\% = (PHS - 7000) / 23075 \Rightarrow PHS = 41,612 \leq \text{high end of range}$$