Reading: BCAR.Cdn2018
Model: from source reading
Problem Type: (B5) for BCAR

Given Calculate B5 for BCAR for each VaR level (capital required for reserve risk)

this insurer is a: primary insurer

diversification factor applicable to these LOBs is: 0.690

reserves	B/S amt	adj	deficiency	discount
LOB1	392	39	0.98	0.91
LOB2	121	6	1.01	0.94

capital factors	VaR 95	VaR 99	VaR 99.5	VaR 99.6
LOB1	0.17	0.26	0.29	0.30
LOB2	0.20	0.30	0.34	0.35

CY	year-end in-force policies	gross premiums written
3rd prior	100	1,000
2nd prior	114	1,109
1st prior	122	1,109
current	122	1,203

industry growth thresholds	
1-yr growth rate	5.0%
3-yr avg growth rate	3.0%

step 1: calculate FAR (Final Adjusted Reserve)

	FAR	=	(B/S amt	+	adj)	x	reserve deficiency factor *	x	discount factor	=	
LOB1:	FAR1	=	(392	+	39)	x	0.980	x	0.910	=	384
LOB2:	FAR2	=	(121	+	6)	x	1.010	x	0.940	=	121

* *a reserve deficiency of 15% would get a deficiency factor of 1.15*

step 2: calculate **required capital** by LOB & VaR level by applying capital factors to FAR from step 1

	VaR 95	VaR 99	VaR 99.5	VaR 99.6
LOB1:	**65**	100	111	115
LOB2:	**24**	36	41	42
total	89	136	152	158

Example: Var 95		from step 1		capital factor VaR 95	
65	=	384	x	0.17	*(given)*
24	=	121	x	0.20	*(given)*

step 3: calculate the final B5 values at each VaR level
(do this by applying the diversification factor and the excess growth factor to the **total** row from step 2)

	VaR 95	VaR 99	VaR 99.5	VaR 99.6	
total	89	136	152	158	
x	0.690	0.690	0.690	0.690	<== diversification factor for independence of LOB1 & LOB2
x	1.039	1.039	1.039	1.039	<== growth factor for LOB1 & LOB2 *(calculated below)*
B5 NRC	**64**	**98**	**109**	**113**	**<== FINAL ANSWER**

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growth factor calculation: since this insurer is a primary insurer we use: in-force policies

CY	growth metric
3rd prior	100
2nd prior	114
1st prior	122
current	122

1-yr growth rate	0.0%	=	(	122	/	122	)	-	1
3-yr avg growth rate	6.9%	=	(	122	/	100	) ^ (1/3)	-	1

industry growth THRESHOLDS

1-yr growth rate	5.0%	*(given)*
3-yr avg growth rate	3.0%	*(given)*

indicated excess growth FACTORS

1-yr growth rate	1.000	=	max (	0.0%	,	0.0%	-	5.0%	)
3-yr avg growth rate	1.039	=	max (	0.0%	,	6.9%	-	3.0%	)

SELECTED excess growth FACTOR

judgement ==> 1.039 = max (1-yr indicated factor , 3-yr indicated factor)

Reading: BCAR.Cdn2018 (BCAR B5 calc - 2) a-Question
Model: from source reading
Problem Type: (B5) for BCAR

Given Calculate B5 for BCAR for each VaR level (capital required for reserve risk)

this insurer is a: reinsurer

diversification factor applicable to these LOBs is: 0.780

reserves	B/S amt	adj	deficiency	discount
LOB1	382	8	0.97	0.90
LOB2	178	11	1.05	0.98

capital factors	VaR 95	VaR 99	VaR 99.5	VaR 99.6
LOB1	0.15	0.23	0.26	0.27
LOB2	0.23	0.35	0.40	0.41

CY	year-end in-force policies	gross premiums written
3rd prior	100	1,000
2nd prior	110	1,097
1st prior	124	1,211
current	139	1,211

industry growth thresholds	
1-yr growth rate	3.0%
3-yr avg growth rate	5.0%

step 1: calculate FAR (Final Adjusted Reserve)

	FAR	=	(B/S amt	+	adj)	x	reserve deficiency factor *	x	discount factor	=	
LOB1:	FAR1	=	(382	+	8)	x	0.970	x	0.900	=	340
LOB2:	FAR2	=	(178	+	11)	x	1.050	x	0.980	=	194

* *a reserve deficiency of 15% would get a deficiency factor of 1.15*

step 2: calculate **required capital** by LOB & VaR level by applying capital factors to FAR from step 1

	VaR 95	VaR 99	VaR 99.5	VaR 99.6
LOB1:	**51**	78	89	92
LOB2:	**45**	68	78	80
total	96	146	166	172

Example: Var 95		from step 1		capital factor VaR 95	
51	=	340	x	0.15	*(given)*
45	=	194	x	0.23	*(given)*

step 3: calculate the final B5 values at each VaR level
(do this by applying the diversification factor and the excess growth factor to the **total** row from step 2)

	VaR 95	VaR 99	VaR 99.5	VaR 99.6	
total	96	146	166	172	
x	0.780	0.780	0.780	0.780	<== diversification factor for independence of LOB1 & LOB2
x	1.016	1.016	1.016	1.016	<== growth factor for LOB1 & LOB2 *(calculated below)*
B5 NRC	**76**	**116**	**132**	**136**	**<== FINAL ANSWER**

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growth factor calculation: since this insurer is a reinsurer we use: gross written premiums

CY	growth metric
3rd prior	1,000
2nd prior	1,097
1st prior	1,211
current	1,211

1-yr growth rate	0.0%	=	(	1,211	/	1,211	)	-	1
3-yr avg growth rate	6.6%	=	(	1,211	/	1,000	) ^ (1/3)	-	1

industry growth THRESHOLDS

1-yr growth rate	3.0%	*(given)*
3-yr avg growth rate	5.0%	*(given)*

indicated excess growth FACTORS

1-yr growth rate	1.000	=	max (	0.0%	,	0.0%	-	3.0%	)
3-yr avg growth rate	1.016	=	max (	0.0%	,	6.6%	-	5.0%	)

SELECTED excess growth FACTOR

judgement ==> 1.016 = max (1-yr indicated factor , 3-yr indicated factor)