

18. (2 points)

An actuary is given the following claims experience for large dollar deductible workers compensation insurance for five identically sized risks. Each claim is a separate occurrence.

	Individual Claims Experience (Gross of Deductible)			
Risk #	Claim 1	Claim 2	Claim 3	Claim 4
1	70,000	80,000		
2	165,000	300,000	250,000	
3	150,000			
4	150,000	250,000	200,000	150,000
5	250,000			

Calculate the expected loss cost for a risk identical to the five above with a per-occurrence deductible of \$150,000 and an annual aggregate deductible of \$450,000.

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QUESTION 18**Total Point Value: 2****Learning Objectives: B2, B7****Sample Answers***Sample 1*

Risk	Total Losses	Deductible Losses - Limited to 150,000	Excess of Aggregate Deductible
1	150,000	150,000	0
2	715,000	450,000	0
3	150,000	150,000	0
4	750,000	600,000	150,000
5	250,000	150,000	0
Total	2,015,000	1,500,000	150,000

$$\text{Total Expected Loss Cost} = \frac{(2,015,000 - 1,500,000) + 150,000}{5} = 133,000$$

Sample 2

Risk	Limited Loss	r
1	70,000 + 80,000 = 150,000	$\frac{150,000}{300,000} = 0.5$
2	150,000 + 150,000 + 150,000 = 450,000	1.5
3	150,000	0.5
4	150,000 + 150,000 + 150,000 + 150,000 = 600,000	2
5	150,000	0.5
Total	1,500,000	

$$\text{Expected Total Loss} = \frac{2,015,000}{5} = 403,000$$

$$\text{Expected Primary Loss} = \frac{1,500,000}{5} = 300,000$$

$$\emptyset(r) = \frac{450,000}{300,000} = 1.5$$

Table M

r	% of risks above	$\emptyset(r)$
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EXAM 8 FALL 2015 SAMPLE ANSWERS AND EXAMINER'S REPORT

0	100%	$0.5+1*0.5=1$
0.5	40%	$0.3+0.4*0.5=0.5$
1	40%	$0.1+0.4*0.5=0.3$
1.5	20%	$0+0.2*0.5=0.1$
2	0%	0

$$\emptyset(1.5) = 0.1$$

$$\text{Expected Loss Cost} = (403,000 - 300,000) + 300,000*0.1 = 133,000$$

Sample 3 – Insured's Perspective

Risk	Deductible Losses - Limited to 150,000	Losses Capped at 450,000
1	$70,000+80,000 = 150,000$	150,000
2	$150,000+150,000+150,000 = 450,000$	450,000
3	150,000	150,000
	$150,000+150,000+150,000+150,000 =$	
4	600,000	450,000
5	150,000	150,000
Total	1,500,000	1,350,000

$$\text{Expected Loss per Risk} = \frac{1,350,000}{5} = 270,000$$

Examiners Report

Candidates did very well on this question overall with many getting full credit. Any deductions were usually due to a small math error.

Common places where candidates lost credit were to not divide the loss cost by 5, or to only calculate the expected loss cost for the per occurrence deductible, or the aggregate deductible but not both.

Some candidates calculated the loss cost from the insured's perspective. While the Examination Committee believes the question and the term 'loss cost' are unambiguous and require calculation from the insurer's perspective, this distinction was not considered to be of central importance in this case. Therefore this was accepted as an alternate solution.