18. (3 points)

A reinsurer is entering into a commutation agreement with a primary insurer. The following information is available about the transaction as at December 31, 2012.

| Period | Estimated Payment to Reinsurer ($) |
|--------|------------------------------------|
| 2013   | $350,000                           |
| 2014   | $150,000                           |

Assume the following:
- Required capital is based on a regulatory approach.
- The company must hold target capital equal to 180% of required capital.
- A margin of 10% of the claims liability is required.
- The discount rate is 1%.
- The risk cost of capital rate is 5%.
- All payments are made in the middle of the year.

a. (2.5 points)

Estimate the commuted value of the claims.

b. (0.5 point)

Identify an advantage and a disadvantage of this transaction from the primary insurer's perspective.

- Benefits must be paid out within 2 weeks
- Premium reduction to be returned directly or indirectly to employees

b)
- Additional Benefits
- Direct $ refund
- No candidate got full marks on this subpart

c)
- Employee is fired for misconduct
- Employee quit voluntarily
- Employee on strike as part of a union

**Examiner's report:**
Most of the candidates poorly answered the question as it is not an important part of the syllabus. We graded this question quite generously for parts a and b accepting all answers close to the model solution. For part c) it was generally quite well answered as it had already been asked in the past and is also considered general knowledge even to those who have not read the paper.

# Question 17
**Answer key:**
Max policy acquisition expenses deferrable = Net UEP + Premium Deficiency + unearned commission – net policy liabilities in connection with UEP
= 155,000 + 0 + 1,000 – 134,000 = 22,000 breakdown properly

The company has recorded 22,500 but the maximum is 22,000 so the amount of acquisition expenses deferred much be reduced by $500. However since there is enough unearned premium to cover the expected policy liabilities there is no need for a premium deficiency.

X: 0
Y: 22,000
Z: 22,000

**Actual candidate answer for full marks:**
EQUP = 155 000 – 134 000 + 1 000 = 22 000
Like DPAE is greater than EQUP, it should be reduced to the level of EQUP

Y=22 000 Z = 22 000 like DPAE = EQUP
X=0 because EQUP is positive

**Examiner's report:**
Candidates performed well on this question in general. Some candidates did not input the unearned commission into the Max policy acquisition expense deferrable formula. A few candidates had calculation errors while the underlying formula was correct.

# Question 18
**Answer key:**
a.

|  | Formula | 2013 | 2014 | Total |
|---|---|---|---|---|
| Estimated Payments in period (a) |  | 350,000 | 150,000 | 500,000 |
| Payment Duration (b) |  | 0.5 | 1.5 |  |
| Discount Rate (c) |  | 1% | 1% |  |
| Present Value Claims Cash Flow (d) | (a)*(1+(c))exp(-(b)) | 348,263 | 147,778 | 496,041 |
| Undiscounted Future Payments (e) |  | 500,000 | 150,000 |  |
| Required Margin (f) |  | 10% | 10% |  |
| Regulatory Capital at 180% (g) | (e)*(f)*1.8 | 90,000 | 27,000 |  |
| Risk Cost of Capital (h) |  | 5% | 5% |  |
| Cost of Capital in Period (i) | (g)*(h) | 4,500 | 1,350 |  |
| Duration (j) |  | 1 | 2 |  |
| Risk (k) | (i)*(1+(c))exp(-(j)) | 4,455 | 1,323 | 5,779 |
| Commuted Value | (d) + (k) |  |  | 501,820 |

b.
Advantages:
Removes concern over credit worthiness of the reinsurer
Accelerated settlement, ending relationship with the reinsurer
Savings in administrative costs of monitoring/reporting claims
Improvement in perceived wealth as cash is valued higher than receivables
Certain immediate amount is substituted for an uncertain future amount
Tax benefit through creation of a marginal underwriting loss

Disadvantages:
Have to hold capital for additional risk (support the liabilities)
Cash outlay, forgo other investment opportunities
Risk of future adverse loss experience

**Actual candidate answer for full marks:**
<u>a.</u>

|  | Total | 2013 | 2014 |
|---|---|---|---|
| Estimated payment | 500,000 | 350,000 | 150,000 |
| PV at i=1% | 496,041 | 350K/1.01^.5 = 348,263 | 150K/1.01^1.5 = 147,778 |
| Capital required |  | 500,000x10%x180% = 90,000 | 150,000x10%x180% = 27,000 |
| Cost of capital |  | 90,000x5%=4,500 | 27,000x5%=1,350 |

| PV Cost of capital | 5,778 | 4,500/1.01^1=4,455 | 1,350/1.01^2=1,323 |

Estimated commuted value of claims = 496,041 + 5,778 = 501,819

***Alternative to the Solution Key:***
AP = Ambivalence point
Assume tax rate is 35%
AP = [AP – 0.95min(Reported Reser ves, APV)] Tax rate + PV(loss)
PV = 350K/(1.01^0.5) + 150K/(1.01^1.5) = 496,041
APV = PV (1+MfAD$_{Claims}$) = 496,041 x (1.1) = 545,645
AP = [AP – 0.95min(500K, 545,645)]x0.35 + 496,041
AP = 0.35AP – 166,250 + 496,041
AP = 507,371

**b.**

***Sample 1:***
Advantage:
- The primary insurer exchanges an uncertain future amount by a certain amount immediately.
Disadvantage:
- The primary insurer may be subject to adverse development (court award, social inflation, …)

***Sample 2:***
Advantage:
- The primary gets a cash flow immediately for assuming the liabilities
Disadvantage:
- The company must now hold capital in order to support the liabilities.

***Sample 3 (assumes primary insurer is buyer of commutation agreement):***
Advantage:
- Not subject to adverse development of loss any more
Disadvantage:
- Cash outlay, forgone some other investment opportunities

**Examiner's report:**
a. Many candidates attempted to use the Steeneck Ambivalence Point calculation, but not all inputs were given. These candidates were awarded partial marks.
   Other common mistakes involved using 350,000 instead of 500,000 as undiscounted future payment in calculation of required capital, mis-applying the 180% regulatory capital, the 5% risk cost of capital, and the durations of 1 and 2 for the PV of risk.

b. Because the table in the question incorrectly stated that the payment was to the reinsurer, and not from the reinsurer, many candidates reversed the advantages/disadvantages listed above. These candidates were given full marks.

# Question 19
**Answer key:**