
SOCIETY OF ACTUARIES
Group and Health Core Exam - Canada

Exam GHCORC

MORNING SESSION

Date: Wednesday, November 1, 2017

Time: 8:30 a.m. – 11:45 a.m.

INSTRUCTIONS TO CANDIDATES

General Instructions

1. This examination has a total of 100 points. It consists of a morning session (worth 60 points) and an afternoon session (worth 40 points).
 - a) The morning session consists of 7 questions numbered 1 through 7.
 - b) The afternoon session consists of 7 questions numbered 8 through 14.

The points for each question are indicated at the beginning of the question. Questions 3, 4, 8 and 9 pertain to the Case Study.
2. Failure to stop writing after time is called will result in the disqualification of your answers or further disciplinary action.
3. While every attempt is made to avoid defective questions, sometimes they do occur. If you believe a question is defective, the supervisor or proctor cannot give you any guidance beyond the instructions on the exam booklet.

Written-Answer Instructions

1. Write your candidate number at the top of each sheet. Your name must not appear.
2. Write on only one side of a sheet. Start each question on a fresh sheet. On each sheet, write the number of the question that you are answering. Do not answer more than one question on a single sheet.
3. The answer should be confined to the question as set.
4. When you are asked to calculate, show all your work including any applicable formulas.
5. When you finish, insert all your written-answer sheets into the Essay Answer Envelope. Be sure to hand in all your answer sheets because they cannot be accepted later. Seal the envelope and write your candidate number in the space provided on the outside of the envelope. Check the appropriate box to indicate morning or afternoon session for Exam GHCORC.
6. Be sure your written-answer envelope is signed because if it is not, your examination will not be graded.

Tournez le cahier d'examen pour la version française.

CASE STUDY INSTRUCTIONS

The case study will be used as a basis for some examination questions. Be sure to answer the question asked by referring to the case study. For example, when asked for advantages of a particular plan design to a company referenced in the case study, your response should be limited to that company. Other advantages should not be listed, as they are extraneous to the question and will result in no additional credit. Further, if they conflict with the applicable advantages, no credit will be given.

****BEGINNING OF EXAMINATION****
Morning Session

1. (6 points) Nahanni is a Canadian insurance company that has hired you as an expert to review insurance contract standards.

(a) (2 points) Compare and contrast IFRS with CALM in regards to:

- (i) Discount rate setting
- (ii) Net contract asset or liability
- (iii) Fulfilment cash flows

Nahanni issued 10-year term life contracts, each with the following information:

- Up front single premium of \$5,000
- Present value of future claims of \$3,000
- Risk margin of \$500

At the end of the first year, the present value of future claims increased to \$4,000. There were no incurred claims during year one.

(b) (2 points)

- (i) (1 point) Define and calculate the contractual service margin (CSM) at the beginning and the end of the first year. Show your work.
- (ii) (1 point) Describe factors that would cause the estimated present value of future claims to change.

(c) (2 points) List and describe each IASB classification of products.

2. (6 points)

- (a) (1 point) List the major group insurance income and expense items for federal tax deduction purposes.
- (b) (2 points)
 - (i) (1 point) List four adjustments that could be made to GAAP financial reports to produce managerial financial reports.
 - (ii) (1 point) Explain why each adjustment in part (i) could be valuable to management.
- (c) (3 points) Describe three main areas in which the financial reporting for group insurance differs from the reporting for individual insurance.

**Questions 3 and 4 pertain to the case study.
Each question should be answered independently.**

3. (13 points)

- (a) (4 points) Another Day has been experiencing rapid growth in its Quebec location and would like to better understand the impact of RAMQ on the benefit program.
- (i) (3 points) Describe each of the following features for a private plan to be RAMQ compliant:
- Mandatory coverage
 - Eligible groups
 - Mandatory provisions
 - Coverage for dependents
 - Eligibility rules
 - Turning age 65
 - Drugs covered and pharmacists' fees
 - Deductibles, coinsurance and maximum contributions
- (ii) (1 point) Identify any changes that are required to make Another Day's benefit plan RAMQ compliant. Justify your response.

3. Continued

- (b) (5 points) One of Another Day's active Quebec employees incurred drug claims of \$250,000 in 2015 and \$80,000 in 2014. The drug is included on the RAMQ list of medications.

There are currently 120 active employees in the Quebec location (30 employees with single coverage and 90 employees with family coverage). There are no retirees from the Quebec location. The following table shows the pooling thresholds for the year 2015:

Size of Group (no. of certificates)	Pooling Threshold (per certificate)
< 25	\$7,500
25 - 49	\$17,000
50 - 124	\$30,000
125 - 249	\$45,000
250 - 499	\$65,000
500 - 999	\$85,000
1,000 – 2,999	\$110,000
3,000 and up	None

- (i) (3 points) Compare and contrast the pooling mechanisms under the Quebec Drug Insurance Pooling arrangement and the Canadian Drug Insurance Pooling arrangement.
- (ii) (2 points) Calculate the portion of the \$250,000 claim in 2015 that would be pooled under each of the Canadian Drug Insurance Pooling arrangement and the Quebec Drug Insurance Pooling arrangement. Show your work.
- (c) (4 points) On March 1, 2016, the Canadian Institute of Actuaries issued a position paper identifying a number of key plan design features that should be considered in establishing a National Pharmacare Plan.

Evaluate the RAMQ plan against these key design features.

**Questions 3 and 4 pertain to the case study.
Each question should be answered independently.**

- 4.** (12 points) Another Day has been experiencing rapid growth and needs to find ways to control rising post-retirement benefit costs. You are an actuary at Skyfall Canada.
- (a) (4 points)
- (i) (2 points) Describe the spectrum of retiree plan design solutions available to employers in moving from a payer role to a facilitator role.
 - (ii) (2 points) Describe issues associated with changing post-retirement benefits for each of the following employee populations:
 - a. New hires;
 - b. Employees who are several years away from retirement;
 - c. Employees who are close to retirement; and
 - d. Existing retirees.

4. Continued

- (b) (8 points) Another Day has decided to amend the retiree benefit plan for employees under age 50 at December 31, 2017. The extended health care benefit will continue to provide future retirees with catastrophic drug and emergency out-of-country health benefits. All other extended health care benefits will be replaced with a fixed \$500 per year health spending account. There will be no change to the retiree life insurance benefit.

Your manager has provided the following information as at December 31, 2017:

Financial and Demographic Assumptions	
Discount rate	4.5% per annum
Trend rate	4.0% per annum
Pre-retirement mortality rate	0.0% per annum
Termination rate	0.0% per annum
Retirement rate	100% at age 58
Employee census data	No change to data provided in case study

Annuity Factors	
Age 58 lifetime annuity factor deferred to age 65 (including trend)	12
Age 58 lifetime annuity factor deferred to age 65 (excluding trend)	8
Age 58 immediate annuity factor to age 65 (including trend)	6
Age 58 immediate annuity factor to age 65 (excluding trend)	5

Claims Cost	
Annual extended health care per capita claims cost before the plan change (including applicable expenses & taxes)	Before Age 65: \$1,988 After Age 65: \$940
Annual extended health care per capita claims cost after the plan change (including applicable expenses & taxes, but excluding the addition of the health spending account)	Before Age 65: \$1,272 After Age 65: \$602

- (i) (4 points) Calculate the extended health care defined benefit obligation immediately before the plan change. Show your work.
- (ii) (4 points) Calculate the extended health care defined benefit obligation immediately after the plan change. Show your work.

5. (8 points) Rundle is a small mobile gaming company in Ontario. Rundle’s management team would like to offer the following group benefits on an insured basis, tax-free for employees:

- Supplemental Medical Benefit
- Dental Benefit
- Vision Care Benefit
- Life Insurance Benefit
- Long Term Disability Benefit

The benefit coverages will be 100% paid by Rundle.

You are the benefit consultant hired by Rundle, and you are meeting with Rundle’s management team to discuss the benefit offerings.

- (a) (2 points) Explain the requirements to offer the aforementioned benefits on an insured basis, tax-free for employees.
- (b) (6 points) The government has just announced a new policy; starting next year dental premiums paid by employers will be considered a taxable benefit to employees.

Rundle’s employees can be classified into the following three profiles:

	Profile 1	Profile 2	Profile 3
Average Age	25	35	45
Marital Status	Single	Married	Married with 1 child
Average Gross Income	\$65,000	\$90,000	\$200,000
Average Income Tax Rate	25%	30%	40%
Marginal Income Tax Rate	35%	40%	50%
Expected Annual Dental Claim next year	\$200	\$3,000	\$2,500
Monthly Dental Premium next year	\$150	\$250	\$400
Spousal Income	\$0	\$0	\$0

Eligible medical expenses that exceed an annual family income threshold can be claimed as a tax credit under the Income Tax Act. The threshold is calculated as follows:

- Lesser of \$2,237 or 3% of net income

Assume 100% of the tax credit will be refunded.

5. Continued

Assume the expected dental claims are eligible medical expenses, and that there are no other eligible medical expenses in the coming year.

- (i) *(4 points)* Rundle is providing open enrolment for dental benefits for next year. Employees have the option to opt out of the benefits.

Assess for each profile whether the employee should participate in the dental benefits for next year with the government's new taxation policy. Show your work.

- (ii) *(1 point)* Based on your analysis in part (i), Rundle would like to exclude dental benefits for employees that fall under one or more of the profiles outlined above.

Critique this decision.

- (iii) *(1 point)* Recommend an alternative solution that Rundle can consider to address the different dental benefit needs among their employees. Justify your response.

- 6.** (8 points) A Canadian insurance company, Bison Ltd., selling group products has the opportunity to write a new group LTD policy for a client operating in the private sector. The policy would be fully insured.

Bison Information:

- The current calculated Minimum Continuing Capital and Surplus Requirements (“MCCSR”) morbidity requirement is \$11,000,000
- Bison invests in the following assets:
 - 60% Government Bonds
 - 30% Grade A Corporate Bonds
 - 10% Outstanding Premiums
- Bison sets an internal capital target of 180% of MCCSR

New group LTD Product Information:

- 1 year rate guarantee
- 6 month elimination period
- Assume all claims are reported within 6 months of end of elimination period
- Annual premiums of \$1,000,000
- IBNR of \$400,000
- Disabled Life Reserves of \$2,000,000
 - 20% of which are in respect of people disabled less than 1 year
 - 30% between 1 and 2 years
 - 50% between 2 and 5 years
 - All people on disability have more than 2 years remaining in their benefit period

(a) (3 points)

- (i) (1 point) List and describe the three MCCSR capital risk components most relevant to this product.
- (ii) (2 points) Explain the factor(s) for each component in (i), including the measure of exposure, and how the factor(s) might vary.

(b) (5 points) Calculate the MCCSR components and internal target MCCSR for this product. State your assumptions and show your work.

7. (7 points) Wolverine is a manufacturing company and offers a Supplemental Unemployment Benefit (“SUB”) program to Employment Insurance (“EI”), for maternity and parental leaves. The SUB plan is funded out of premiums for Wolverine’s short term disability plan, which is 100% employee-paid.

The SUB plan available to Wolverine employees provides 95% of pay for 17 weeks.

Zoe, who works at Wolverine in Manitoba, gave birth on January 1, 2016. Zoe’s annual salary is \$65,000 and she has worked full-time for the past five years.

Zoe’s husband John works at Muskrat & Co., which does not offer any form of SUB plan. John’s salary is \$45,000 and he has worked full-time for the past seven years.

Assume Zoe and John each have an effective tax rate of 30%.

- (a) (1 point) Describe the government benefits available to Zoe as income replacement for time off work after giving birth (assuming she does not go on disability).
- (b) (1 point) Describe the additional government benefits available to Zoe if she becomes disabled as a result of giving birth.
- (c) (2 points) Calculate the net income from each source that Zoe will receive over the following periods, assuming that she does not return to work for 12 months following the birth of her child and John continues working:
- (i) Weeks 1 to 17
- (ii) Weeks 18 to 52

Show your work.

- (d) (3 points) Calculate the maximum after-tax replacement ratio that John and Zoe can receive for the 12 months following the birth of their child if at least one of them must be off work at all times during that period. Show your work.

****END OF EXAMINATION****
Morning Session

USE THIS PAGE FOR YOUR SCRATCH WORK