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**SOCIETY OF ACTUARIES**  
**Group and Health Core Exam - Canada**

# **Exam GHCORC**

## **MORNING SESSION**

**Date:** Wednesday, April 30, 2014  
**Time:** 8:30 a.m. – 11:45 a.m.

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### **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 6 questions numbered 1 through 6.
  - b) The afternoon session consists of 5 questions numbered 7 through 11.

The points for each question are indicated at the beginning of the question.
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.





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

- 1.** (10 points) A U.S. employer just hired you to expand its business across Canada. The key decision makers will reside in the U.S. and do not have Canadian expertise in the delivery of government benefits and the requirements for private group insurance plans.
- (a) (1 point) Describe the criteria provincial Medicare plans must meet with respect to the Canada Health Act.
  - (b) (2 points)
    - (i) Describe approaches used by different Canadian provinces to fund government sponsored medical benefits.
    - (ii) For each approach, identify a province to which it applies.
  - (c) (1 point) List and compare medical services typically provided for middle income active employees through government benefit plans in Canada and in the U.S.
  - (d) (3 points) Describe the interaction between provincial Medicare plans and private insurance plans including potential concerns regarding Medicare if the private health provider market expands.
  - (e) (3 points)
    - (i) Describe policy provisions typically included in a private group health insurance plan in Canada.
    - (ii) Explain why they are needed.

2. (12 points) You are the Pricing Actuary for a small insurer in Canada. In 2012, Group Long-Term Disability (LTD) profits reduced compared to the preceding year and are lower than expected. Your Vice-President has asked you to investigate the situation.

You have been given the following LTD financial information:

	2012 Financial Statement					
	ACTUAL			EXPECTED		
	First Year	Renewal	Total	First Year	Renewal	Total
<b>Income</b>						
<i>Premiums</i>	15,000,000	95,000,000	110,000,000	7,000,000	104,000,000	111,000,000
<i>Investment Income</i>	325,000	15,000,000	15,325,000	140,000	15,200,000	15,340,000
<b>Total Income</b>	<b>15,325,000</b>	<b>110,000,000</b>	<b>125,325,000</b>	<b>7,140,000</b>	<b>119,200,000</b>	<b>126,340,000</b>
<b>Disbursements</b>						
<i>Benefits paid</i>	1,300,000	39,500,000	40,800,000	490,000	41,000,000	41,490,000
<i>Change in Actuarial Liabilities</i>	14,325,000	49,500,000	63,825,000	6,650,000	55,000,000	61,650,000
<i>Experience Rating Refunds</i>	0	200,000	200,000	0	2,000,000	2,000,000
<i>Operating Expenses</i>	1,500,000	9,500,000	11,000,000	630,000	9,360,000	9,990,000
<i>Commissions</i>	740,000	4,750,000	5,490,000	350,000	5,200,000	5,550,000
<i>Premium Taxes</i>	300,000	1,900,000	2,200,000	140,000	2,080,000	2,220,000
<b>Total Disbursements</b>	<b>18,165,000</b>	<b>105,350,000</b>	<b>123,515,000</b>	<b>8,260,000</b>	<b>114,640,000</b>	<b>122,900,000</b>
<b>Net Income (Loss) Before Income Taxes</b>	<b>–</b>	<b>–</b>	<b>–</b>	<b>–</b>	<b>–</b>	<b>–</b>
<b>Taxes</b>	<b>[2,840,000]</b>	<b>4,650,000</b>	<b>1,810,000</b>	<b>[1,120,000]</b>	<b>4,560,000</b>	<b>3,440,000</b>

- (a) (1 point) Describe the differences between group and individual lines of business when determining sources of earnings.
- (b) (4 points) Describe the methodology commonly used to analyze sources of earnings in the group line of business.
- (c) (7 points)
- Calculate the 2012 LTD sources of earnings. Show your work.
  - Based on your analysis in (i), describe further analyses that you would undertake to explain the situation.

3. (10 points) Joey Bats is a Canadian company that manufactures baseball bats. The company employs 75 individuals; 25 in each of British Columbia, Ontario and Quebec. The following table highlights the current life insurance, drug and travel medical plan design for all active employees:

Benefit	Provisions
Life Insurance	Two times annual salary, rounded up to the nearest \$1,000
Drug	Prescription drugs: 80% reimbursement until the member is out-of-pocket \$1,000, and then 100% reimbursement
Travel Medical	Emergency out-of-province and out-of-country services: 100% reimbursement to a lifetime maximum of \$60,000

Employees may elect single or family level coverage for the Drug and Travel Medical benefits.

Joey Bats pays 50% of the premium for each benefit.

Joey Bats hires you, a group benefits consultant, to help manage the program.

- (a) (2 points) Joey Bats would like you to audit the most recent year's drug claims. Describe how to maintain the privacy of employees' personal information and what information can be disclosed to you and Joey Bats' management, in order to comply with applicable laws.
- (b) (3 points) Management at Joey Bats would like to understand the impact of RAMQ in Quebec.
- (i) Describe the requirements for a private plan to be RAMQ compliant and any required changes to Joey Bats' plan.
- (ii) Explain changes Joey Bats can make to encourage employees in Quebec to participate in RAMQ upon reaching age 65.
- (c) (2 points)
- (i) Outline the drug pooling requirements of insurers and self-insured plan administrators in Quebec, and explain the rationale of the government of Quebec in putting into place these requirements.
- (ii) Describe the rules for establishing the Quebec drug pooling threshold for participating insurers and self-insured plan administrators.

### 3. Continued

- (d) (1 point) The company has a terminated employee age 55 who would like to continue their life insurance coverage. Explain any guidelines that apply and what options may be available.
  
- (e) (2 points) A member of the executive team decided to take some time away and flew to North Carolina for a weekend of golf. While on the course, she was struck by an errant golf ball resulting in a minor skull fracture that required four days of hospitalization. Before going on vacation, she purchased travel insurance which covered 100% after a deductible of \$25,000 to a maximum of \$2,000,000. The total claim cost is \$125,000 which the employee submits to her individual insurance carrier.

Calculate the payment made by each of the two insurers and describe how the payment is made to each party. Show your work.

4. (14 points) Company XYZ is a Canadian subsidiary of a U.S. parent company. XYZ offers a post retirement dental plan to their employees. Your manager has given you the following simplified valuation assumptions:

Discount rate: 5% per annum  
Trend rate: 4.5% per annum  
Current annual claims cost per capita: \$500  
Termination rate: 3% per annum  
Pre-retirement mortality rate: 0% per annum  
Retirement rate: 100% at age 65  
Age 65 annuity factor (including trend): 12

Plan Details:

Coverage Level: Single  
Company XYZ pays 100% of the costs  
No unamortized balances exist  
Future balances would be amortized through profit and loss

Employee demographics are as follows:

Number of employees: 500  
Age of employees: 45  
Years of service for each employee: 5  
Number of retirees: 200  
Age of retirees: 65

- (a) (2 points) Explain how you would validate each of your manager's assumptions and the sources you would reference.
- (b) (2 points) Describe how you would modify each assumption to increase the accuracy of the calculation in a formal valuation.
- (c) (3 points) Calculate the Accrued Benefit Obligation. Show your work.
- (d) (4 points) An assumption change has increased the annual claims cost per capita to \$600. Calculate the annual accounting expense under both IAS 19 (2008) and FAS 106 assuming the minimum amortization allowed by each accounting standard. State all assumptions and show your work.
- (e) (3 points) A plan design change has increased the annual claims cost per capita to \$600. Calculate the new annual accounting expense under IAS 19 (2008) and FAS 106. State all assumptions and show your work.



5. (8 points) You are a consulting actuary who has been hired by MonCo, an investment firm to determine whether to invest in Oingo, a U.S. group health insurance company. Your contact at MonCo worked in Canada prior to 2010.

You have been provided statutory financial statements for Oingo from the past several years, as well as the following Oingo figures on a GAAP basis:

Oingo Prior Year Info

Total Asset Turnover	70%
Net Profit Margin	3.5%
Total Leverage Ratio	150%

Additionally, MonCo has indicated they are looking for a return on equity of greater than 5% in order to invest in Oingo.

- (a) (1 point) List the items included in the Life-1 annual statement under Canadian GAAP.
- (b) (2 points) Describe how the 2011 change to IFRS in Canada affected group insurance Statutory reporting results.
- (c) (1 point) Describe the major modifications that must be made to U.S. Statutory reporting results for group health insurers when converting to U.S. GAAP.
- (d) (1 point) Explain the key conceptual differences between U.S. Statutory reporting and U.S. GAAP reporting for group health insurers.
- (e) (2 points) Define and explain the three financial measures provided by Oingo.
- (f) (1 point) Explain whether MonCo should invest in Oingo based on MonCo's return on equity requirements. Justify your answer.

- 6.** (6 points) Company ABC offers a long-term disability (LTD) plan to its employees but does not offer a short-term disability (STD) plan.

The LTD plan pays a monthly benefit equal to 66.7% of pre-disability income (monthly maximum of \$6,000) after a 17 week elimination period. The monthly premium is 100% employee paid.

John, who works at Company ABC, recently sprained his back when moving a box at work. John's annual salary is \$200,000.

- (a) (2 points) Describe government income replacement programs available to John and specify differences by province.
- (b) (2 points) Describe other benefits offered by employment insurance.
- (c) (2 points) John's injury was determined to be the result of aggravating a problem with his back caused a few months earlier while skiing. He was approved for a monthly CPP benefit of \$1,000 after 12 months on disability. John's tax rate while on disability is 20%.
- (i) Calculate the overall net payment to John during his second month of disability. Show your work.
- (ii) Calculate the overall net payment John would receive in month 14. Indicate the sources of this payment and show your work.

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

**USE THIS PAGE FOR YOUR SCRATCH WORK**

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