

Exam GHVRC

Date: Wednesday, November 1, 2023

INSTRUCTIONS TO CANDIDATES

General Instructions

1. This examination has 7 questions numbered 1 through 7 with a total of 70 points.

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

2. 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 provided in this document.

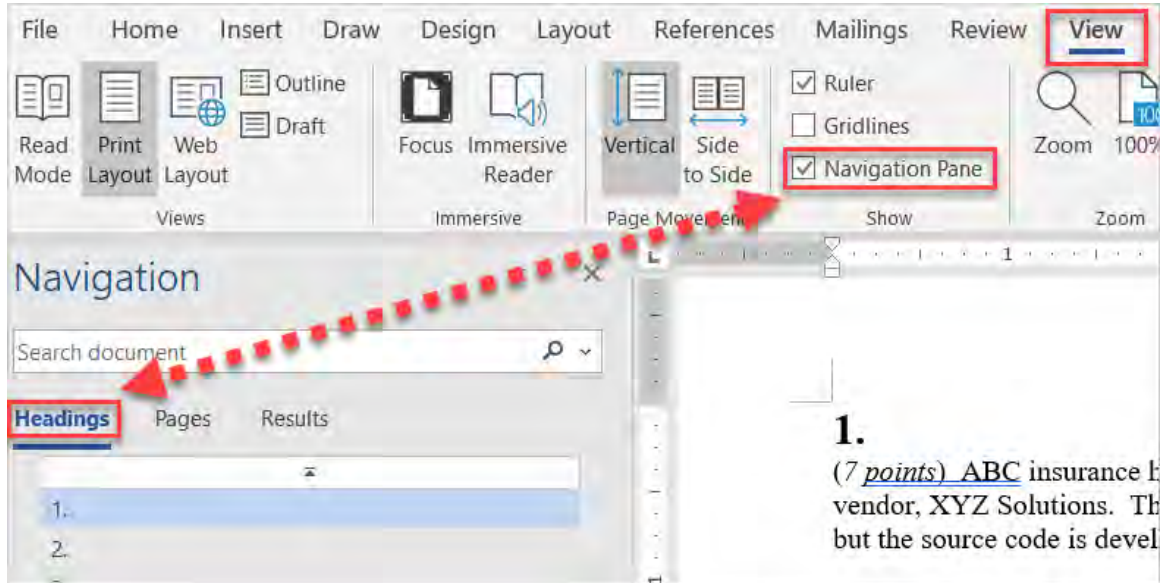
Written-Answer Instructions

1. Each question part or subpart should be answered either in the Word document or the Excel file as directed. Graders will only look at work in the indicated file.
 - a) In the Word document, answers should be entered in the box marked ANSWER. The box will expand as lines of text are added. There is no need to use special characters or subscripts (though they may be used). For example, β_1 can be typed as beta_1 (and ^ used to indicate a superscript).
 - b) In the Excel document formulas should be entered. Performing calculations on scratch paper or with a calculator and then entering the answer in the cell will not earn full credit. Formatting of cells or rounding is not required for credit.
 - c) Individual exams may provide additional directions that apply throughout the exam or to individual items.
2. The answer should be confined to the question as set.
3. Prior to uploading your Word and Excel files, each file should be saved and renamed with your five-digit candidate number in the filename.
4. The Word and Excel files that contain your answers must be uploaded before time expires.

Navigation Instructions

Open the Navigation Pane to jump to questions.

Press Ctrl+F, or click View > Navigation Pane:



The Excel spreadsheet has additional data and information applicable to this question.

1.

(10 points) You are the valuation actuary for ABC Insurance Company.

(a) (2 points)

(i) Describe the Tabular method, Examiner's method, and Factor method.

ANSWER:

(ii) Explain for which lines of business it is appropriate to use each method.

ANSWER:

In the Excel spreadsheet, Exhibit 1 provides paid claims by incurred month for four scenarios.

(b) (3 points) Recommend whether the development method is appropriate for each scenario. Justify your answer.

The response for this part is to be provided in the Excel spreadsheet.

Guidance from your chief actuary is that there must be a minimum of 10 months of claim payments when using the development method.

In the Excel spreadsheet, Exhibit 2 provides paid claims by incurred month with large paid claims removed.

(c) (1 point) Recommend the incurred month to be used as the basis for an age-to-ultimate development factor reserve. Show your work and justify your answer.

The response for this part is to be provided in the Excel spreadsheet.

(d) (2 points) Calculate the IBNR as of January 31, 20X2 using your recommendation from (c). Show your work.

The response for this part is to be provided in the Excel spreadsheet.

1. Continued

In the Excel spreadsheet, Exhibit 3 provides new information regarding reported unpaid large claims. Assume all large claims have been reported and the discharge date for all members is December 31, 20X2.

The Medical Director of ABC Health Insurance Company has reviewed the medical conditions for each member in the hospital and provided you the following information:

Hospital	Contract Terms
A	60% Percent of Charges
B	40% Percent of Charges
C	\$4,000 Average Cost Per Day
D	\$2,500 Average Cost Per Day

Additionally, there is a financial arrangement that caps insurer liability at \$300,000 per member per year.

- (e) (2 points) Calculate the total case reserve for the members in Exhibit 3. Show your work.

The response for this part is to be provided in the Excel spreadsheet.

2.

(9 points) Company ABC's employee benefits program is being reviewed by management after experiencing sustained rising costs in recent years, largely due to biologic drug utilization and significant dental fee guide increases.

The CFO of the company has contacted you to discuss the federal government's role with respect to prescription drug pricing and the recently implemented national dental-care plan.

(a) (2 points)

(i) Describe the mandate of the Patented Medicines Prices Review Board (PMPRB).

ANSWER:

(ii) List challenges faced by the PMPRB.

ANSWER:

(b) (1 point) List and describe the proposed changes to the Patented Medicines Regulations to protect Canadians from excessive prescription drug prices.

ANSWER:

(c) (2 points) Summarize the challenges faced by the federal government in implementing its national dental-care plan.

ANSWER:

2. Continued

The review has been completed and Company ABC is considering the following changes:

- Participating in the insurer's biosimilar program, in which existing patients on biologics would be required to switch to the biosimilar or remain on the biologic and pay the difference in cost
- Eliminating the employer dental program in its entirety to allow employees to apply for the national dental-care plan

The CFO is aware of an employee who would be impacted by the switch to the biosimilar program and is considering providing a one-time cash payment that will allow the employee to remain on the biologic until retirement.

You are provided with the following:

- The employee is age 60 and is assumed to retire at 65
- Other information:

Monthly cost of biologic	\$2,500, increasing at 7.00% annually
Monthly cost of biosimilar	\$1,875, increasing at 6.00% annually
Treatment schedule	One injection on the 1 st of every month
Annual interest rate	4.00%
Employee salary	\$100,000
Marginal income tax rate	35.00%

- (d) (2 points) Calculate the required one-time cash payment that will allow the employee to remain on the biologic until retirement at no additional cost. State any assumptions and show your work.

The response for this part is to be provided in the Excel spreadsheet.

The CFO indicates that the company can commit to 60% of the one-time cash payment you calculated. You approach the manufacturer of the biologic to negotiate an annual rebate for the remainder.

You are provided with the following information:

- Rebates are payable annually on the last day of the year
 - Rebates are not taxable
 - Rebates are equal in dollar amounts every year
- (e) (1 point) Calculate the minimum annual rebate you need to negotiate. State any assumptions and show your work.

The response for this part is to be provided in the Excel spreadsheet.

2. Continued

(f) (1 point) Recommend whether Company ABC should implement either of the below changes. Justify your answers.

(i) Participating in the insurer's biosimilar program

ANSWER:

(ii) Eliminating the employer dental program

ANSWER:

The Excel spreadsheet has additional data and information applicable to this question.

3.

(12 points) You are a consulting actuary for Company ABC. The company provides health and dental benefits to employees during retirement.

You are completing the December 31, 20X1 year-end actuarial valuation of Company ABC's retiree benefits plan under IAS 19 requirements and have been provided with the following information:

Plan provisions:

Eligibility criteria	Age 65 (no minimum service requirement)
Dental coverage	Unlimited for the lifetime of the retiree
Prescription drug coverage	Unlimited for the lifetime of the retiree
Dependent coverage	No coverage

Census data as at December 31, 20X1:

	Count	Age	Years of service
Actives	120	42.0	8.0
Retirees	30	70.0	Not applicable

The Excel spreadsheet provides the valuation assumptions as at December 31, 20X1.

(a) (4 points) Calculate the following for Company ABC's retiree benefits plan:

(i) Defined Benefit Obligation (DBO) as at December 31, 20X1

The response for this part is to be provided in the Excel spreadsheet.

(ii) Current service cost for 20X2

The response for this part is to be provided in the Excel spreadsheet.

State any assumptions and show your work.

3. Continued

The CFO of Company ABC is concerned about inflation and would like to understand more about health care cost trends.

- (b) (2 points) List the national and global factors that impact health care cost trend rates.

ANSWER:

- (c) (2 points) Describe the considerations in developing:

- (i) Initial short-term health care cost trend rate assumptions

ANSWER:

- (ii) Long-term health care cost trend rate assumptions

ANSWER:

- (iii) Transition assumptions between the initial short-term and long-term health care cost trend rates

ANSWER:

The CFO has decided to remove Company ABC's exposure to health care cost trend entirely by replacing the existing retiree benefits plan with a health care spending account (HCSA) benefit for both current and future retirees effective immediately.

You are provided with the following information:

HCSA amount	\$2,500 per year per retiree, assumed to be fully utilized
Annual trend rate	None; the HCSA is expected to remain fixed
Benefit period	Benefits cease at age 75

All other applicable assumptions remain the same.

- (d) (2 points) Calculate the revised DBO as at December 31, 20X1 for the proposed retiree HCSA benefit. State any assumptions and show your work.

The response for this part is to be provided in the Excel spreadsheet.

3. Continued

In response to these proposed amendments, the union representing Company ABC's workforce has filed a grievance, arguing that any plan changes require mutual agreement between Company ABC and the union.

(e) (2 points)

- (i) Recommend next steps for company ABC to respond to the grievance. Justify your answer.

ANSWER:

- (ii) Recommend plan changes company ABC could consider to address the union concerns. Justify your answer.

ANSWER:

The Excel spreadsheet has additional data and information applicable to this question.

4.

(11 points) You are the group benefits consultant for ABC Company, based in Ontario, and have been negotiating the 20X1 group benefits renewal with their insurer. You successfully negotiated a no-change position to all premium rates for 20X1 and report the good news to the CFO.

You receive the following reply from the CFO:

Thank you for securing this renewal for 20X1.

While the no-change position is great news, our plan remains exposed to many external risks which make next year's renewal difficult to predict. In particular, all the recent discussions over Canada Health Transfer payments have me concerned about further government offloading of costs to employers.

We are budgeting a 15% increase for 20X2, but in the event that more is required, we may have to enact contingency plans to remain market-competitive on employee salaries.

I would like to start with a worst-case scenario, in which we would eliminate the group benefits plan in its entirety in 20X2 and direct those funds towards employee salaries and applicable payroll taxes (CPP, EI, EHT). Every employee would receive the same raise on a percentage basis.

I have attached an Excel spreadsheet with all relevant information necessary.

While I am not seeking to cancel the group benefits plan, we must consider it. Besides, if any employee were to become disabled, at least the Canada Pension Plan (CPP) disability benefit is available to them.

Thank you again.

4. Continued

(a) (2 points)

(i) Critique the CFO's assertion concerning the CPP disability benefit.

ANSWER:

(ii) Describe how the disabled employee's group benefits would be impacted if the plan were to terminate.

ANSWER:

(b) (3 points) With respect to the CFO's concerns over government offloading of costs, you review the 2014 revisions to the Canada Health Transfer (CHT) payment calculations.

(i) List and describe how the federal government supports provinces and territories with the funding of health care expenditures.

ANSWER:

(ii) Describe the 2014 revisions to CHT payment calculations and what their expected impacts were.

ANSWER:

(iii) List approaches available to governments to safeguard the sustainability of Canada's health care system.

ANSWER:

4. Continued

(c) (5 points) Calculate the following:

(i) The budgeted group benefits plan costs for 20X2.

The response for this part is to be provided in the Excel spreadsheet.

(ii) The raise in employee salaries that the result in (i) would fund.

The response for this part is to be provided in the Excel spreadsheet.

State any assumptions and show your work.

(d) (1 point) Recommend whether ABC Company should eliminate its group benefits plan in exchange for higher employee salaries. Justify your response.

ANSWER:

5.

(13 points) You are an actuary at MNO Insurance, a health insurance carrier. Part of your role includes the IFRS 17 implementation for an innovative 4-year term product that MNO is preparing to launch.

The newly appointed chief actuary has requested that you classify expenses associated with this new product according to IFRS 17.

- (a) (1 point) Describe the two interpretations of directly attributable expenses.

ANSWER:

You are given the following expense items associated with the new 4-year term product:

Expense Items	Timing of expense	(\$000s)
Claim handling	Recur annually	3
Company holiday party	Recur annually	4
Insurance company tax filing	Recur annually	3
Recruitment of employees working for the product	Incur prior to issuance	2.5
Investment management	Recur annually	17
Marketing	Incur prior to issuance	10
Policy issuance	Incur prior to issuance	5
Pricing	Incur prior to issuance	16.5
CEO salary	Recur annually	8
Services of external risk management consultants	Recur annually	15
Statutory reporting	Recur annually	12
Medical underwriting	Incur at inception	12
Other directly attributable expenses	Incur prior to issuance	45
Other non-directly attributable Expenses	Incur at inception	30

- (b) (1 point) Calculate the following:

- (i) Directly attributable expenses

The response for this part is to be provided in the Excel spreadsheet.

- (ii) Non-directly attributable expenses

The response for this part is to be provided in the Excel spreadsheet.

State any assumptions and show your work.

5. Continued

The chief actuary has also requested that you prepare a projected statement of profit or loss for the new product.

You are given the following information in addition to the calculated expenses in part (b):

Items	Timing	(\$000s)
Premiums	paid up-front	1,500
Claims	per annum	200

- No risk adjustment or discounting
- Contractual Service Margin (CSM) is run-off on a straight-line basis
- No inflation on maintenance expenses
- Claims and expenses occur as expected

- (c) (4 points) Create the projected statement of profit or loss that covers the duration of the product. State any assumptions and show your work.

The response for this part is to be provided in the Excel spreadsheet.

You discussed your projections with the chief actuary who has raised concerns that you did not vary the expenses by year.

- (d) (1 point) Describe the primary factors affecting directly attributable expense projections.

ANSWER:

The chief actuary has reviewed your projected statement of profit or loss and suggested that according to the guidelines outlined in IFRS 17, there can be instances where the classification of expense items becomes uncertain or ambiguous. She recommended that expense items falling within the grey area should be treated using the alternative interpretation of directly attributable.

- (e) (3 points) Create the projected statement of profit or loss in accordance with the instructions provided by the chief actuary. State any assumptions and show your work.

The response for this part is to be provided in the Excel spreadsheet.

5. Continued

(f) (1 point)

- (i) Recommend which interpretation of directly attributable expenses you should use based on your calculations in part (c) and (e). Justify your answer.

ANSWER:

- (ii) Recommend actions that should be taken in implementing the interpretation in (i). Justify your answer.

ANSWER:

Given the current tumultuous economic conditions, the chief actuary has requested additional projections depicting a scenario with a 20% increase in claims and directly attributable expenses.

(g) (2 points)

- (i) Identify the key elements of Financial Condition Testing (FCT).

ANSWER:

- (ii) Propose corrective management actions in response to this scenario. Justify your answer.

ANSWER:

6.

(6 points) You are an actuary working for New Life Insurance (New Life), a Canadian group insurance company.

One of New Life's large clients, Great Product, has a new Chief Human Resources Officer (CHRO) and has reached out to you with a number of questions with respect to its fully-insured group benefits plan.

The CHRO has noticed that some important information is missing when New Life issues booklets to Great Product employees.

- (a) (2 points) List the elements that a booklet should contain according to Guideline G3 from the CLHIA.

ANSWER:

The CHRO has learned that Great Product is considering self-insuring its Long Term Disability (LTD) plan.

- (b) (1 point) List the advantages and disadvantages of a self-insured LTD plan.

ANSWER:

6. Continued

Great Product pays 90% of the cost of the group benefits plan, and the CHRO would like to learn more about the taxation of its fully insured group benefits for its employees.

(c) (2 points)

- (i) Identify whether or not each of the group benefits are taxable for Alberta employees by completing the table below.

Benefit	Are premiums paid or contributions made by the employer taxable income for the employee?		Are benefits received by the employee taxable income for the employee?	
	Federal level	Provincial level	Federal level	Provincial level
Basic life				
Accidental Death and Dismemberment (AD&D) insurance				
LTD insurance				
Health and dental benefits				

ANSWER:

- (ii) Identify changes to the table in (i), if any, for employees residing in Quebec.

ANSWER:

6. Continued

The CHRO has health and dental care coverage under the Great Product plan and their spouse's group plan.

You are given the following information:

Provisions	Great Product's plan	Spouse's group plan
Deductible	\$0	\$100
Coinsurance	75%	80%
Annual paid maximum	\$750	\$1,500

- The CHRO's first claim is for \$1,000
- (d) (1 point) Calculate the total amount paid by each plan. State any assumptions and show your work.

The response for this part is to be provided in the Excel spreadsheet.

7.

(9 points) You are the valuation actuary at XYZ Life Insurance company (XYZ) responsible for overseeing the annual filing process of the Life Insurance Capital Adequacy Test (LICAT).

(a) (2 points)

- (i) List and describe each component in the formulas for the Total Ratio and Core Ratio.

ANSWER:

- (ii) State the minimum and the supervisory target for the ratios in (i).

ANSWER:

XYZ offers a bundled group plan consisting of Long-Term Care (LTC) and term life insurance with the following characteristics:

- The LTC coverage provides up to 48 months of benefits should the insured require assistance with activities of daily living (ADLs)
- The term life coverage provides a payment of \$1,000,000 on the death of the insured
- The plan includes a waiver of premium provision and is subject to individual medical underwriting
- Premiums are guaranteed for 5 years

(b) (4 points)

- (i) List and describe the insurance risk components required for the bundled plan.

ANSWER:

- (ii) Describe the steps to calculate each component in (i), including shock factors.

ANSWER:

7. Continued

You are provided with the following balance sheet information:

Gross Tier 1 Assets	\$4,500,000
All deductions from Gross Tier 1 except those relating to Deferred Tax Assets (DTA)	\$2,402,000
DTA arising from temporary differences	\$300,000
DTA other than those arising from temporary differences	\$100,000
Deferred Tax Liability (DTL) associated with goodwill	\$50,000
Other DTL	\$120,000

- (c) (3 points) Calculate the DTA Temporary amount included in available capital. State any assumptions and show your work.

The response for this part is to be provided in the Excel spreadsheet.

****END OF EXAMINATION****