

Exam GHVRC

Date: Wednesday, April 30, 2025

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.

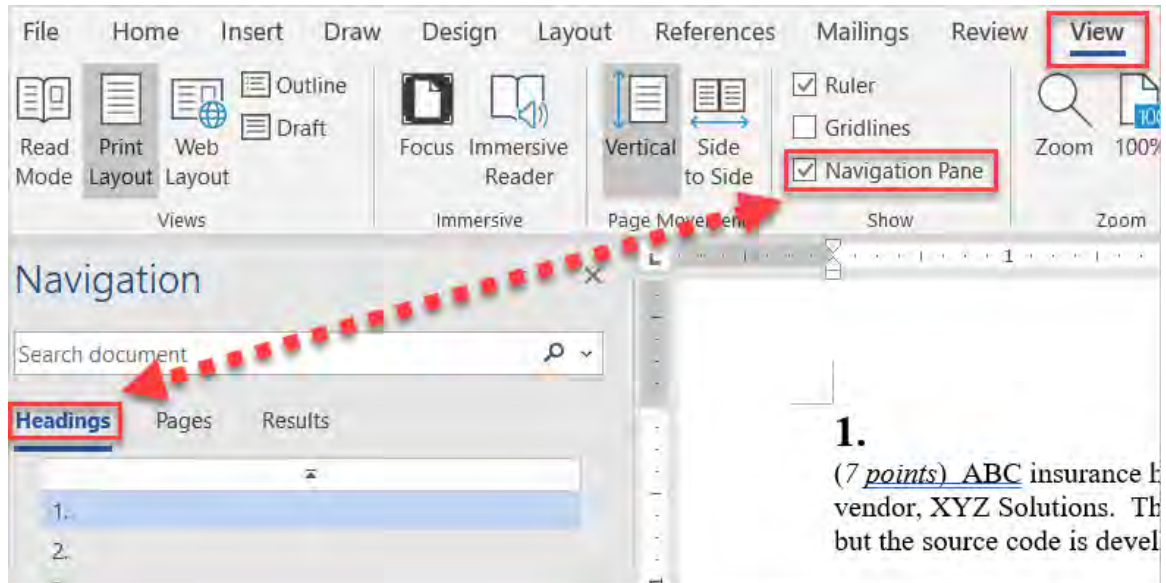
- c) Individual exams may provide additional directions that apply throughout the exam or to individual items.

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 unique 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.

(12 points)

- (a) (2 points) Describe how reserving assumptions and considerations differ under various reporting applications.

ANSWER:

- (b) (1 point) Explain how actuaries can address drawbacks when using the development method.

ANSWER:

- (c) (3 points) List and describe four methods other than the development method for estimating claims reserves.

ANSWER:

- (d) (1 point) Explain cases where each method described in (c) above is preferred.

ANSWER:

Your boss has asked you to help in the calculation of incurred but not reported (IBNR) reserves.

In the Excel spreadsheet, you are provided historical claims data paid through 5/31/20X2.

- (e) (5 points) Calculate average completion factors as of 12/31/20X1 for each lag using the following averaging methods:
- (i) 3 of last 3
 - (ii) 4 of last 6

Show your work

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

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

2.

(7 points) You are the group benefits consultant for ABC, a brewing company located in Manitoba. ABC provides life, disability, and health benefits to its employees.

As part of ABC's corporate culture regarding Diversity, Equity, and Inclusion (DEI), the director of human resources at ABC reached out to you to review its benefits plan.

- (a) (2 points) List and describe how ABC can integrate DEI into their benefits plans.

ANSWER:

ABC is considering implementing a Health Care Spending Account (HCSA) and a Wellness Spending Account for its employees.

- (b) (3 points)

- (i) Describe the key principles governing the structure of a HCSA.

ANSWER:

- (ii) Describe the rules of the Canadian Revenue Agency (CRA) with respect to the rollover of unused credits and excess claims in a HCSA.

ANSWER:

- (iii) Compare and contrast the characteristics of a HCSA versus a Wellness Spending Account.

ANSWER:

2. Continued

ABC has been contemplating expansion into Quebec due to particularly strong sales results in that province, but they are concerned about increased costs per employee driven from higher premium taxes and sales taxes.

In the Excel spreadsheet, you are provided with the following information:

- Benefits plan information
 - The average annual salary per employee
 - The average annual ASO health claim cost per employee
- (c) (2 points) Calculate ABC's additional per employee annual costs if they proceed with expansion into Quebec. State any assumptions and show your work.

<i>The response for this part is to be provided in the Excel spreadsheet.</i>

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

3.

(11 points) Your client used to report under ASC 715 and would like to understand the differences with IAS 19.

(a) (2 points) Compare the methodology under ASC 715 and IAS 19 with respect to:

- Cost/Expense recognized
- Service cost
- Gain/loss recognition
- Past service cost

ANSWER:

(b) (1 point) Describe typical demographic assumptions needed to perform a post-retirement benefits plan valuation.

ANSWER:

(c) (1 point) Describe typical financial assumptions needed to perform a post-retirement benefits plan valuation.

ANSWER:

In the Excel spreadsheet, you are provided with the following information:

- Plan provisions of the post-retirement benefits plan
- Census data as of December 31, 20X1
- Valuation assumptions

(d) (4 points) Calculate the following:

- (i) Defined Benefit Obligation (DBO) as of December 31, 20X1
- (ii) Current service cost for 20X2

State any assumptions and show your work.

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

3. Continued

For your client's December 31, 20X2 year-end disclosures, the following assumption changes have been made:

- Claim costs are \$1,000 as of July 1, 20X3 (excluding expenses)
- Medical trend is 4.0% per year
- The effective discount rate is 4.0% per year on December 31, 20X2

Additionally:

- The active employee is still an active employee as of December 31, 20X2
- The retiree is still alive as of December 31, 20X2
- Actual benefit payments for 20X2 are equal to expected

- (e) (3 points) Create a reconciliation of the DBO for the year 20X2 by completing the following table:

Change in DBO	Year 20X2
DBO at end of prior year	
Current service cost	
Interest expense	
Benefit payments from employer	
Remeasurements	
- Effect of changes in demographic assumptions	
- Effect of changes in financial assumptions	
- Effect of experience adjustments	
DBO at end of year	

State any assumptions and show your work.

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

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

4.

(8 points) As a valuation actuary at XYZ Life Insurance Company in Canada, you are responsible for preparing the financial statements for a closed block of fully-insured group life policies.

(a) (2 points)

- (i) List the key components required in the Appointed Actuary Report (AAR) as mandated for inclusion in the Life-1 annual statement by regulatory authorities.

ANSWER:

- (ii) Describe the general principles for valuation according to Canadian Asset Liability Method (CALM).

ANSWER:

4. Continued

IFRS 17 is set to replace the traditional Canadian GAAP as XYZ's accounting standard. As the head of valuation at XYZ, you are assigned the task of presenting a brief summary of the key aspects of IFRS 17.

(b) (2 points)

- (i) Compare and contrast the calculation of discount rate for insurance contract liabilities under IFRS 17 versus under CALM.

ANSWER:

- (ii) Describe the two main approaches for developing discount rate curves under IFRS 17.

ANSWER:

You are asked to prepare a Source of Earnings (SOE) report for the calendar year-end 20X1 for the closed block of fully-insured group life policies.

In the Excel spreadsheet, you are provided with information gathered from the pricing and valuation teams.

(c) (4 points)

- (i) Write down the formula for the expected profit contained in the SOE report.
- (ii) Write down the formula for the experience gains or losses contained in the SOE report.
- (iii) Calculate the result in (i) and (ii).
- (iv) Create an SOE report in accordance with the CIA standards.

State any assumptions and show your work.

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

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

5.

(11 points) Company ABC, operating in Saskatchewan, offers a Long-Term Disability (LTD) benefit whose premiums are employee-paid.

Due to budget constraints, employee salaries have not kept pace with inflation and employee retention is becoming a concern. To help address this issue, Company ABC is proposing:

- Moving the LTD benefit from employee-paid to employer-paid.
- Adjusting the plan design to provide employees with a similar after-tax LTD benefit.
- Introducing a cost-of-living-adjustment (COLA) to the LTD benefit.

Company ABC has contacted you, a benefits consultant, to help assess the proposed plan design.

In the Excel spreadsheet, you are provided with the following information:

- Company ABC's current and proposed LTD plan designs
- Employee information
- Individual income tax table
- Insurer assumptions

- (a) (2 points) Assess whether the proposed plan design adequately maintains employee LTD benefits on an after-tax basis. State any assumptions and show your work.

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

- (b) (6 points) Calculate the following for the proposed design:

- (i) The expected percentage increase in total monthly premiums paid to the insurer.
- (ii) The expected percentage increase in the insurer's monthly premium rate, expressed on a per \$100 of monthly benefit basis.

State any assumptions and show your work.

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

5. Continued

As Company ABC believes several of the insurer's assumptions are overly conservative, they are considering self-insuring the proposed LTD plan design.

- (c) (1 point) Describe four risks associated with self-insured LTD arrangements.

ANSWER:

You are provided with the following information:

- Company ABC believes that termination rates should be 25% higher.
 - Company ABC can earn an annual discount rate of 8.0%.
 - Company ABC would retain the insurer to administer a self-insured LTD plan. The insurer would charge 15.0% of paid claims.
 - Applicable payroll taxes under a self-insured LTD arrangement would equal 5.0% of paid claims.
 - Company ABC will apply a stress test of doubled incidence rates.
- (d) (2 points) Analyze whether Company ABC should proceed in self-insuring the LTD benefit. State any assumptions and show your work.

<i>The response for this part is to be provided in the Excel spreadsheet.</i>

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

6.

(12 points) You are a consulting actuary hired by XYZ Life Insurance Company (XYZ) to conduct Financial Condition Testing (FCT) analysis.

(a) (2 points)

- (i) Describe the considerations supporting the integration of FCT with the Own Risk and Solvency Assessment (ORSA).

ANSWER:

- (ii) Describe the challenges you may encounter when integrating the FCT and the ORSA.

ANSWER:

You are preparing the FCT filing for XYZ.

In the Excel spreadsheet, you are provided with assumptions for three projection scenarios.

- (b) (2 points) Calculate the following projected income statement items for XYZ under each of the three scenarios for projection years 1 to 10, using the table provided in the Excel spreadsheet:

- Premiums
- Death claims
- Investment income
- Change in reserve
- Expenses
- Gain/loss

State any assumptions and show your work.

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

6. Continued

In the Excel spreadsheet, you are provided with the key assumptions XYZ applies for LICAT.

- (c) (3 points) Calculate the total LICAT ratios for projection years 1 to 10 under each scenario. State any assumptions and show your work.

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

- (d) (2 points) Recommend a FCT opinion based on answers from parts (b) and (c). Justify your answer.

ANSWER:

You are presented with two scenarios that may financially impact XYZ:

- Scenario #1 – An increase in mental health claims due to the prolonged effect of Covid-19.
- Scenario #2 – A new competitor has emerged, leveraging a substantial advertising budget to rapidly capture market share.

- (e) (3 points)

- (i) Identify the risks associated with each scenario.

ANSWER:

- (ii) Describe the potential ripple effects with each scenario.

ANSWER:

- (iii) Propose managerial actions that could be taken to mitigate the adverse impacts of these two scenarios.

ANSWER:

7.

(9 points) Company ABC, a manufacturing firm located in Alberta, has identified employee absenteeism as an increasingly significant corporate risk.

The costs of Company ABC's absenteeism is measured in lost productivity. A third-party consulting firm has estimated that for every day absent, Company ABC is losing 300% of the absent employee's daily salary in productivity.

Company ABC's employee distribution is as follows:

Age	Count	Average annual salary
30	50	\$50,000
40	150	\$75,000
50	65	\$90,000
60	30	\$115,000

Additionally:

- There are 260 working days in a year.
- Employer payroll taxes equal 8.0% of salary.
- Employees are absent from work 10.0 days per year on average. Half are due to illness, in which employees receive 70% of their regular salary. Otherwise, no salary replacement is provided.

The third-party consultant has proposed that Company ABC's lost productivity could be reduced from 300% to 75% if an employee's absence is covered by another employee. Doing so would require the employee to be paid overtime, equal to 150% of salary.

- (a) (3 points) Recommend whether Company ABC should adopt the third-party consultant's proposal. State any assumptions and show your work.

<i>The response for this part is to be provided in the Excel spreadsheet.</i>

7. Continued

Company ABC is considering providing a prescription drug program to its employees to help manage employee illness. As a first step, they would first like to understand more about National Pharmacare.

(b) (4 points)

- (i) Describe the principles that a National Pharmacare program should follow, according to the Hoskins Report.

ANSWER:

- (ii) Describe the Canadian actuarial community's proposed framework to National Pharmacare.

ANSWER:

- (iii) Describe the Canadian actuarial community's considerations to ensure the long-term sustainability of National Pharmacare.

ANSWER:

The third-party consultant has estimated that providing employees with a 50-50 cost-share of prescription drugs will reduce employee illness by one day a year on average.

You are provided with the following information:

- Industry data indicates that an average 40-year old requires \$1,250 of prescription drug coverage per year.
 - Utilization trend due to aging: 2.0% per year (e.g., someone age 41 claims 2.0% more than age 40)
 - Insurer's target loss ratio: 90.0%
- (c) (2 points) Evaluate whether Company ABC should offer the prescription drug coverage with reference to your recommendation in part (a). State any assumptions and show your work.

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

****END OF EXAMINATION****