

Exam GHVRU

Date: Wednesday, May 3, 2023

INSTRUCTIONS TO CANDIDATES

General Instructions

1. This examination has 9 questions numbered 1 through 9 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.

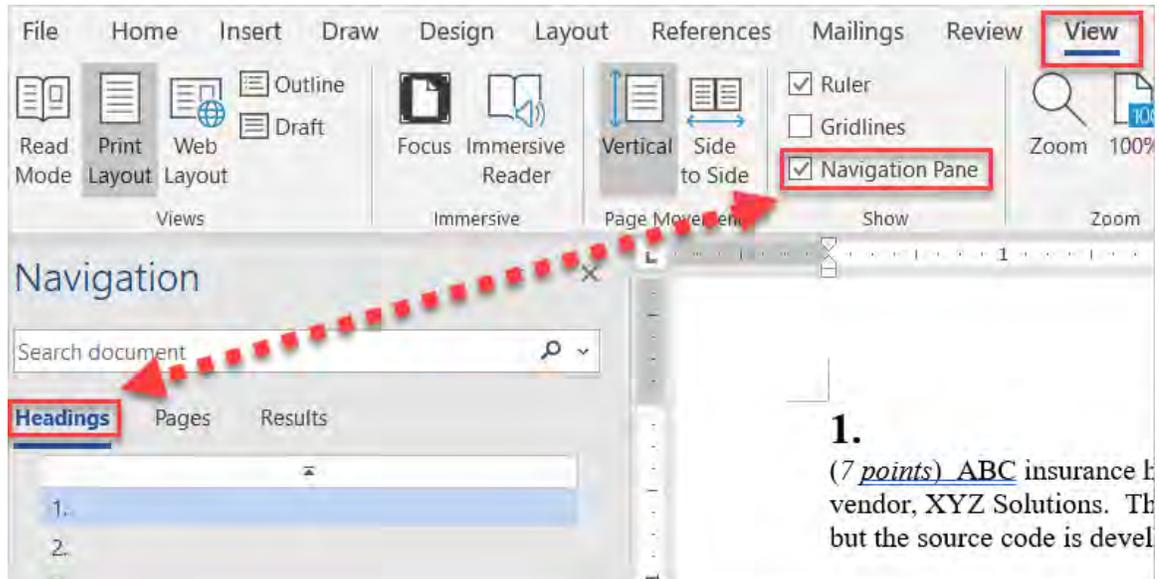
c) Individual exams may provide additional directions that apply throughout the exam or to individual items.

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.

(12 points) Canadian insurance company XYZ has offered group life and long-term disability (LTD) coverages for decades. In January 20X1, the company started to offer accidental death and dismemberment (AD&D), short term disability (STD), and supplemental health coverage to their existing clients.

As an actuarial analyst, you are asked to prepare reserve calculations for all lines of business.

- (a) (2 points) List and describe the types of claim reserves and claim liabilities required in regulatory statements.

ANSWER:

- (b) (3 points)

- (i) List and describe basic techniques to estimate claim reserves.

ANSWER:

- (ii) Recommend reserve methods for each of XYZ's products. Justify your answer.

ANSWER:

In the Excel spreadsheet, you are provided with the historical supplemental health paid claims since the coverage became effective in January 20X1.

- (c) (4 points) Calculate the total incurred health claims from January 20X2 to June 20X2 using an average of the most recent six months' age-to-age factors. Show your work.

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

- (d) (1 point) Critique the use of the development method in part (c).

ANSWER:

1. Continued

- (e) (2 points) Calculate the Incurred But Not Paid (IBNP) reserve as of June 30, 20X2 by applying both credibility weights and an alternative method. State your assumptions and show your work.

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

2.

(5 points) You are a valuation actuary for a company selling individual Long-Term Care (LTC) policies. You are given the following information for the LTC block:

Year (t)	Mortality at Year (t)	Annual Claims
0	0.0000	\$0.00
1	0.0113	\$120.74
2	0.0135	\$146.38
3	0.0162	\$168.19
4	0.0194	\$190.02
5	0.0221	\$209.85

Assume the following:

- Annual lapse rate is 5%
- All claims, deaths, and lapses occur at the end of the year
- Interest rate is 0%
- Net level premiums are paid at the start of the year

- (a) (3 points) Calculate the reserve per in-force policy for each year, using the prospective method for years 1 and 2, and the retrospective method for years 3 and 4. Show your work.

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

- (b) (2 points)

- (i) Describe two examples of LTC claim administration practices that may create bias in the claims reserves.

ANSWER:

- (ii) Explain methods to adjust for bias in the examples in (i).

ANSWER:

3.

(9 points) You have recently been hired as the only actuary for Sparkle, a start-up company focusing on individual insurance sold on the state exchange. Sparkle has a need to construct financial models to manage its business.

- (a) (2 points) List and describe six purposes for which financial models are created in the individual health business.

ANSWER:

- (b) (1 point) Describe characteristics of a good forecasting model.

ANSWER:

- (c) (2 points)

- (i) Describe an auto-correlative model.

ANSWER:

- (ii) Assess the need to build an auto-correlative forecasting model for Sparkle. Justify your answer.

ANSWER:

You are building a model for projecting financial results.

- (d) (1 point) List four modeling validation approaches you plan to use.

ANSWER:

- (e) (1 point) Describe considerations for reviewing the data used in your model according to ASOP 23.

ANSWER:

3. Continued

You need to complete the report on the modeled results started by a non-actuary on your team.

(f) (2 points)

(i) List disclosures required in an actuarial report, pursuant to ASOP 41.

ANSWER:

(ii) Describe four standards against which you might compare your results in the report.

ANSWER:

4.*(4 points)*(a) *(2 points)* In the table below:

- (i) List the formula(s) for each component of the DuPont Formula.
- (ii) Describe what each component measures.

Component	Formula(s)	Measures
Net Profit Margin		
Total Asset Turnover		
Total Leverage Ratio		
Return on Equity		
Return on Assets		

(b) *(1 point)* You are an actuary at Company X, a publicly traded company. Company X's Finance department provides you the following information for 20X1.

Health benefit ratio	82.0%
Administrative expense ratio	17.4%
Investment Income, as a percent of revenue	4.6%
Non-operating expense, as a percent of revenue	2.2%
Total Asset Turnover	2.28
Total Leverage Ratio	1.75
Corporate tax rate	21%

Calculate Company X's shareholder equity as a percent of revenue. Show your work.

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

4. Continued

(c) (1 point)

- (i) Identify a component of the DuPont Formula that would differ significantly between a staff model plan and a fee-for-service plan, all else being equal. Justify your response.

ANSWER:

- (ii) Recommend an adjustment that could be made to a different component of the DuPont Formula to counteract the effect described in (i) and achieve the same Return on Equity. Justify your response.

ANSWER:

5.

(7 points) You are an actuary for ABC insurance company in charge of pricing and filing the premium rates for ABC's small group non-grandfathered plans.

- (a) (2 points) List and describe the rating characteristics allowed for these plans under the Affordable Care Act (ACA).

ANSWER:

After completing your first draft of pricing, your manager asks you how the COVID pandemic affected your pricing.

- (b) (1 point) Explain how the Coronavirus Aid, Relief, and Economic Security (CARES) Act directly affected health insurers.

ANSWER:

You have completed the pricing and are preparing the rate filing to be submitted to the state.

- (c) (2 points) Describe the core components required by the Centers for Medicare and Medicaid Services (CMS) for non-grandfathered plan rate filings.

ANSWER:

You are developing an actuarial report to be submitted with your rate filing.

- (d) (2 points) Describe the items you should disclose in your report to comply with ASOP 8.

ANSWER:

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

6.

(11 points) As of January 1, 20X1, Oculus Inc. has decided to terminate its self-funded retiree medical plan. While active employees will receive a lump-sum payout, current retirees will continue to receive coverage until December 31, 20X3. You are evaluating the impact of these changes and assisting the accounting department with the financial reporting.

In the Excel spreadsheet, there are assumptions and exhibits with cost and demographic information for this group.

(a) (2 points) Describe the accounting treatment(s) applied to the recognition of the plan change for the Accumulated Postretirement Benefit Obligation (APBO) and Net Periodic Postretirement Benefit Cost (NPPBC).

(i) For active employees

ANSWER:

(ii) For retired employees

ANSWER:

(b) (2 points) Calculate the APBO as of January 1, 20X1 under the new plan. Show your work.

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

6. Continued

You are preparing the financial statements for the Oculus Inc. self-funded retiree healthcare liabilities for 20X2.

(c) (4 points)

- (i) Explain the aspects of short-duration contracts relevant to the Oculus Inc. retiree healthcare liability under US GAAP.

ANSWER:

- (ii) Describe US statutory accounting concepts that influenced the development of National Association of Insurance Commissioners (NAIC) guidance for financial reporting for tax purposes.

ANSWER:

6. Continued

Oculus Inc. is headquartered in the United States, and it is being acquired by a company headquartered in the United Kingdom that will assume Oculus's contracts as a U.S. insurer. You are working with the accounting team preparing financial statements for the acquiring company, and the team is concerned about how to group and measure liabilities for the acquirer.

(d) (3 points)

- (i) Compare and contrast the various approaches the team could use to measure the liabilities under US GAAP.

ANSWER:

- (ii) Recommend an approach for preparing the financial statements. Justify your response.

ANSWER:

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

7.

(7 points) You are the Appointed Actuary at Mockingbird Corporation.

The company's new CEO believes that Contract Reserves are unnecessary for Mockingbird's individual Long-Term Disability (LTD) products, as the company holds Unearned Premium Reserves.

- (a) (1 point) Describe the role of an Appointed Actuary, including relevant rules and responsibilities for the position.

ANSWER:

- (b) (1 point) Contrast the purposes of an Unearned Premium Reserve and a Contract Reserve.

ANSWER:

- (c) (1 point) Describe circumstances in which Mockingbird would not need to hold a Contract Reserve.

ANSWER:

- (d) (1 point) Explain why having appropriate Claims Reserves, Unearned Premium Reserves, and Contract Reserves may not always be sufficient to demonstrate reserve adequacy under Statutory Accounting Principles (SAP)

ANSWER:

7. Continued

You are provided with the following information on four employees insured by Mockingbird.

Gender	Age	Elimination Period	Policy Start Date	Status	Months Disabled	Premium Mode	Gross Monthly Premium	Gross Monthly Benefit
Male	35	3 months	6/1/2010	Disabled	60	Monthly	\$5.00	\$4,000
Female	28	6 months	1/1/2015	Disabled	4	Annual	\$3.50	\$2,500
Male	37	3 months	1/1/2012	Disabled	48	Annual	\$6.00	\$3,000
Female	44	3 months	1/1/2020	Active	n/a	Five-year prepaid	\$4.50	\$1,500

You are given the following assumptions:

- Coverage includes waiver of premium upon disability
- Premiums are due at the beginning of the month

In the Excel worksheet, you are provided with reserve factors for various ages and durations.

(e) (3 points) Calculate the following:

- (i) Contract Reserve as of 1/31/2022
- (ii) Unearned Premium Reserve as of 1/31/2022

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.

8.

(9 points) You are hired as a risk expert by an insurance company.

In the Excel spreadsheet, the financials for the company are provided.

- (a) (2 points) Assess whether the company should be filing the Blue Blank or the Orange Blank. Show your work. Justify your answer.

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

- (b) (5 points) Calculate the Authorized Control Level (ACL) for the company using the Blue Blank. Show your work.

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

The CFO of the company would like to lower the ACL.

- (c) (2 points) Propose two options for lowering the ACL, including a numeric example for each that illustrates its potential impact.

ANSWER:

9.

(6 points) You are the Appointed Actuary at Diversity Insurance Company.

You have been provided excerpts of Diversity's 20X2 financial planning pro-forma analysis:

Figures in \$ millions	Commercial	Medicaid	Medicare
Revenue	200.0	15.0	40.0
Claims	184.0	13.0	32.0
Administrative Expenses	22.0	1.7	7.0

- (a) (2 points) Describe the considerations in determining the need for a premium deficiency reserve for a health insurer.

ANSWER:

Diversity's commercial block of business data excerpt includes a block of guaranteed renewable long-term care business.

- (b) (1 point) Justify whether you have sufficient information to calculate a premium deficiency reserve as of December 31, 20X1.

ANSWER:

- (c) (3 points) Specific to the requirements of Diversity as regulated by a state agency that is a member of the National Association of Insurance Commissioners (NAIC):

- (i) Describe the publicly available statutory financial reports that Diversity is required to submit to the state regulatory agency based on NAIC rules.

ANSWER:

- (ii) Describe the confidential statutory financial reports that Diversity is required to submit to the state regulatory agency based on NAIC rules.

ANSWER:

****END OF EXAMINATION****