

Exam GHVRU

Date: Wednesday, November 1, 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.

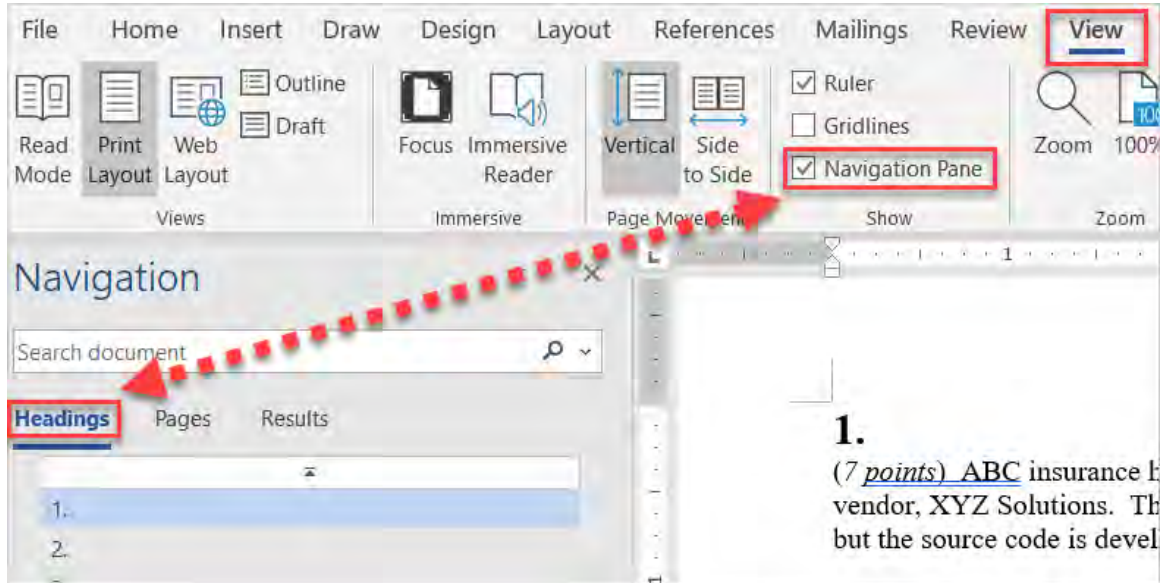
Written-Answer Instructions

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.

(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.

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

2.

(9 points) You are the valuation actuary for a large multi-line managed care organization. Your chief actuary has tasked you with identifying and measuring non-claim liabilities. There are three distinct blocks of business with different provider or outcome-based contingencies:

- Non-Grandfathered Small Group Fully Insured
 - This block is subject to ACA regulations.
 - Providers are solely reimbursed by a set fee schedule.
- Grandfathered HMO Small Group Fully Insured
- Large Group with Claim Stabilization Reserves (CSR)

- (a) (1 point) Identify and describe any provider or outcome-based liabilities that should be accounted for on the Non-Grandfathered Small Group Fully Insured block.

ANSWER:

- (b) (1 point) Identify and describe considerations when setting the liabilities in part (a).

ANSWER:

For the Grandfathered HMO Small Group Fully Insured block, there are four groups of providers that are reimbursed with the following structure:

- Inpatient services
 - \$100 PMPM target
 - If inpatient experience is lower than the target amount, providers keep 40% of the surplus.
- Physician services
 - \$50 PMPM target
 - Physician claims are subject to a 10% withhold. If a positive balance exists in the fund, providers will earn up to the withhold amount.
 - The withhold on physician services will be applied against any deficits created by losses in inpatient services.

2. Continued

In the Excel spreadsheet, you are provided additional financial data for each provider group.

- (c) (2 points) Calculate the withhold and incentive liabilities for each provider group. Justify your answer and show your work.

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

- (d) (1 point) Describe considerations when accounting for physician withholding.

ANSWER:

- (e) (1 point) Describe considerations when estimating provider-related assets and liabilities.

ANSWER:

- (f) (1 point) Describe Claim Stabilization Reserves (CSR), including their advantages to employer groups.

ANSWER:

Assume the following for four large group customers each with a CSR:

- The minimum CSR is 5% of premium.
- Risk charges are 2% of premium.
- Interest is 5% of the prior CSR.
- Groups do not have to retroactively fund a minimum CSR.

In the Excel spreadsheet, you are provided additional financial data for each large group customer.

- (g) (2 points) Calculate the maximum experience refund for each of the four large group customers. Justify your answer and show your work.

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

3.

(6 points)

- (a) (1 point) List and describe three key types of premium reserves.

ANSWER:

You are given a block of policies that is currently holding Gross Unearned Premium reserves.

Policy Number	Premium Mode	Date Premium Last Paid	Valuation Date	Premium Amount	Gross Unearned Premium
#001	Single Premium	1/1/20X1	6/1/20X1	\$4,000	?
#002	Annual	1/1/20X1	7/1/20X1	?	\$550
#003	Quarterly	7/1/20X1	?	\$3,000	\$1,000
#004	Annual	?	3/1/20X1	\$12,000	\$8,000

- (b) (1 point) Calculate the four missing (?) cells. Justify your answers.

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

You are given a block of active policies.

Policy Number	Premium Mode	Total Annual Premium	Policy Effective Date	Valuation Date	Premium Received as of Valuation Date	Premium Reserve / Asset	Premium Reserve Type
#005	Annual	\$20,000	1/1/20X1	1/1/20X1	\$25,000	?	?
#006	Monthly	\$6,000	7/1/20X1	9/1/20X1	?	\$1,000 Reserve	?
#007	Quarterly	\$12,000	7/1/20X1	?	\$3,000	\$3,000 Reserve	?
#008	Monthly	\$15,000	3/1/20X1	3/1/20X1	\$1,250	?	?

- (c) (1 point) Calculate the eight missing (?) cells. Justify your answers.

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

3. Continued

(d) (3 points) Assess the accuracy of the following statements by identifying which are true or false. Justify your answer.

- (i) An insurer can calculate its profits and losses by subtracting paid claims and paid administrative expenses from premium received.

ANSWER:

- (ii) Liabilities are for obligations which have not yet been incurred or not yet accrued.

ANSWER:

- (iii) Reserves are for obligations that are already incurred and accrued.

ANSWER:

- (iv) The goal of statutory statements is to match profit streams with revenue streams with some conservatism.

ANSWER:

- (v) Mid-terminal reserves are the average of the reserves held on the first and last days of the year.

ANSWER:

- (vi) For premium due and unpaid, all unpaid premium can be booked as an asset according to statutory accounting.

ANSWER:

4.

(5 points) You are provided the following information for a group of 1,000 policies written on 1/1/20X1:

Year	Policies In Force	Per Policy Claims	Net Level Premium Policy Reserve	Net Level Premium
20X1	E	D	\$824,071.11	A
20X2	700	\$5,830	C	A
20X3	300	\$6,430	B	A
20X4	100	\$6,830	\$141,094.55	A
20X5	0	\$7,250	\$0	A

Assume the following:

- Policies in force are as of the end of the year
- Premiums are paid at the beginning of the year
- Claims are paid in the middle of the year
- Lapses occur at the end of the year
- Reserves are calculated as of the end of the year
- Interest rate is 5% per year

- (a) (4 points) Calculate the missing values A through E in the above table using prospective and retrospective formulas as necessary. Show your work.

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

- (b) (1 point) Calculate the two-year full preliminary term liability (2YFPT) as of 12/31/20X3. Show your work.

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

5.

(6 points) You are given the following information for a postretirement benefit program:

Plan Design	
Annual Benefit Amount	\$250 per year of post-age 40 service Maximum of 20 years
Benefit Duration	Last payable age is 75

Assumptions	
Termination Rates	4% per year, stops at full eligibility
Retirement Rates	50% at 62; 100% at 65
Mortality	None
Disability	None
Discount Rate	4.5% per year
Service Cost	Calculated at the beginning of year

Calculate the following for an employee, hired at age 35, and currently age 45. Show your work.

- (i) (3 points) EPBO
- (ii) (1 point) APBO
- (iii) (1 point) Service Cost
- (iv) (1 point) Interest Cost

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

6.*(12 points)*

- (a)
- (2 points)*
- Contrast GAAP financial statements and statutory financial statements

ANSWER:

- (b)
- (1 point)*
- List primary users of each type of financial statement.

ANSWER:

You are given the following financial statement information for three companies:

Income Statement (\$M)	Company A	Company B	Company C
Premium Revenue	\$400	\$240	\$15
Operating Expenses	\$375	\$224	\$13
Non-Operating Expenses	\$2.5	\$2.5	\$0.8

Balance Sheet (\$M)	Company A	Company B	Company C
Total Current Assets	\$150	\$80	\$35
Total Fixed Assets	\$50	\$20	\$15
Total Current Liabilities	\$50	\$50	\$5
Long-term Debt	\$25	\$2	\$1

Assume an effective tax rate of 20%.

- (c) *(2 points)* Calculate the following financial metrics for each company. Show your work.
- (i) Return on Equity
 - (ii) Total Leverage Ratio
 - (iii) Return on Assets
 - (iv) Net Profit Margin
 - (v) Total Asset Turnover

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

6. Continued

All three companies assume the following for next year:

- An increase of 8% in operating expenses
- An increase of 3% in non-operating expenses
- No change in liabilities

- (d) (2 points) Calculate the increase in revenue required for each company to maintain the same return on equity as the current year. Show your work.

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

- (e) (1 point) Explain why the required revenue increase varies by company.

ANSWER:

Company C is considering adding an ASO component to its business.

- (f) (2 points) Describe the differences in accounting for fully-insured and ASO contracts.

ANSWER:

Company C adds \$5 million in ASO revenue with a 6% net profit margin to the projections developed in part (d). It plans to issue \$4.5 million in new equity to finance the expansion.

- (g) (1 point) Calculate the following projected financial metrics for Company C. Show your work.

- (i) Return on Equity
- (ii) Total Leverage Ratio
- (iii) Return on Assets
- (iv) Net Profit Margin
- (v) Total Asset Turnover

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

6. Continued

- (h) *(1 point)* Explain how the financial metrics in part (g) would change if Company C financed the expansion with debt instead of equity.

ANSWER:

7.

(8 points)

- (a) (2 points) Explain the strategies a patent-holder may employ to extend the lifespan of a patent.

ANSWER:

- (b) (3 points)

- (i) Describe legislation that focuses on intellectual property reforms for the pharmaceutical industry.
- (ii) Explain what strategies from (a) this legislation is addressing.

ANSWER:

You are the large group commercial pharmacy actuary for a health insurer. Generic Dispensing Rates (GDR) are as follows:

- 20X1 actual: 85%
- 20X2 actual: 86%
- 20X3 projected: 90%

Several high-volume prescription drugs successfully extended the lifespan of their patents. You now expect the 20X3 actual GDR to be in line with historic results.

- (c) (3 points) Explain the actuarial implications of this variance for your company, the covered employers, and their employees.

ANSWER:

8.

(9 points) Your company is expanding into a new state, and your boss has been tasked with developing a competitive strategy to produce profitable growth. She writes an email to you:

Actuarial Analyst, I've been thinking about our task to grow profitably and here are some ideas I've come up with (remember at the last meeting with corporate they said we should focus on a Preferred Provider Organization (PPO) arrangement to limit disruption. So a Health Maintenance Organization (HMO) is not an option anymore):

1. *For companies that don't mind disruption, there should be an option for an Exclusive Provider Organization (EPO) as well. We would be the only one in the market who does this. It could be a big win!*
2. *For the broader PPO, let's be selective about who our In-Network providers are and only look for efficient & effective providers*
3. *Our benefit differentials shouldn't be TOO large, maybe 20% at most, between in and out of network benefits.*
4. *To keep costs down, let's exclude all chiropractic care. None of the competitors offer this benefit.*
5. *For high impact claims, like transplants, we should ONLY let members use our closest hospital partner. It might mean people need to travel a few hours to get there, but it is worth it because we know they do a great job and will limit issues post operation. The current market leader in membership does this with transplants and rare cancer diagnoses. We should definitely follow suit.*
6. *There is no time to build a Utilization Review (UR) team so let's talk to corporate and we can find a 3rd party partner that already operates in the market to do our UR.*
7. *I know we have an in with Hospital A in the state capital (the CFO there used to work for us), and they have an extensive provider network. Maybe we can work that connection to get a Most Favored Nations clause on our discounts with them.*
8. *For Rx, we have a few options to be competitive. We can retain 100% of the rebates, which will help us to have higher levels of profit!*

I don't KNOW the rules and regulations in the new state so please review these ideas with legal when you get a chance!

8. Continued

- (a) (5 points) From the email above:
- (i) Identify the type of PPO Regulation each recommendation potentially violates.

ANSWER:

- (ii) Assess the likelihood of each recommendation violating state law into: likely, unlikely, or not enough information. Justify your answer.

ANSWER:

Your boss is the filing actuary for your company. She writes you the following email:

Actuarial Consultant (congrats on the promotion!) – I'm trying to draft this filing. I am good with the assumptions to include, but can you provide me a checklist of the other information I should be checking for before I sign and submit! Oh, I also need a brief description so I know I'm hitting the mark in my draft. Thanks so much!

- (b) (4 points) List and describe the applicable issues and recommended practices when preparing a rate filing.

ANSWER:

9.

(5 points) You are assisting the accounting department in reviewing your company's insurance products. You determine that a contract reserve will need to be booked.

- (a) (2 points) Compare and contrast the SAP and GAAP guidance on contract reserves.

ANSWER:

- (b) (1 point) Describe the tax implications for contract reserves.

ANSWER:

- (c) (2 points) Describe different methods of modifying contract reserve factors.

ANSWER:

****END OF EXAMINATION****