

# Exam GHFVU

**Date:** Wednesday, November 2, 2022

## INSTRUCTIONS TO CANDIDATES

### General Instructions

1. This examination has 11 questions numbered 1 through 11 with a total of 100 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.

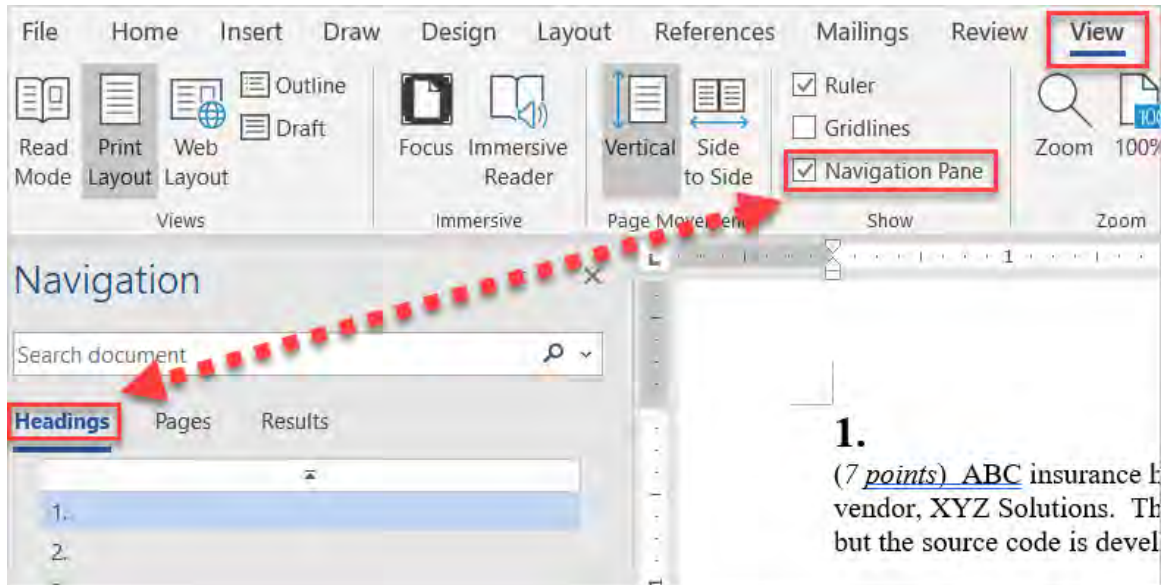
### Written-Answer Instructions

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,  $\beta_1$  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:



**1.**

(8 points) You are a valuation actuary responsible for Osgoode Insurance Company's Premium Deficiency Reserve (PDR) calculation.

(a) (2 points) Compare and contrast the testing and reporting contract grouping levels with respect to:

(i) The purpose of the contract grouping

ANSWER:

(ii) Factors impacting how the contract grouping is accomplished

ANSWER:

(b) (1 point) Describe the components that should be included when documenting the assessment of whether a PDR is needed.

ANSWER:

## 1. Continued

Osgoode Insurance Company offers long-term disability (LTD) and long-term care (LTC) coverage. The LTC membership has been gradually shrinking in recent years, and the company has learned that the vendor software it uses to process LTC claims will no longer be supported as of July 1, 2024. Osgoode Insurance Company will incur expenses in 2024 to obtain and implement replacement software. Osgoode Insurance Company projects the following for its LTC and LTD lines of business:

Year	Annual Projected Results – Long-Term Care (\$000s)		
	Earned Premium	Incurred Claims	Expenses
2023	653	588	59
2024	692	609	113
2025	714	663	58
2026	735	671	65

Year	Annual Projected Results – Long-Term Disability (\$000s)		
	Earned Premium	Incurred Claims	Expenses
2023	2,755	1,873	614
2024	2,975	1,993	688
2025	3,184	2,229	703
2026	3,423	2,396	771

## 1. Continued

You have been asked to begin the process to assess PDR at the reporting level. Management proposes grouping the LTC and LTD lines of business and provides the following rationale:

- LTC and LTD are both long-term products
- Since LTC membership is expected to continue to shrink, the LTC block is not material as its own grouping
- The LTD block has consistently higher underwriting gains and can help offset the 2024 projected loss for LTC resulting from the cost of migrating to the new claims processing software

- (c) (1 point) Describe American Academy of Actuaries guidance concerning the treatment of expenses that you should consider in your assessment of Osgoode's PDR.

ANSWER:

- (d) (2 points) Critique management's proposal.

ANSWER:

## 1. Continued

You are asked to calculate the PDR for Osgoode Insurance Company. Assume the following:

- Annual interest rate of 1.5%
- Cash flows for premium occur on January 1 of each year
- Cash flows for claims and expenses occur on July 1 of each year

(e) (2 points) Calculate the PDR as of December 31, 2022 in the below scenarios. Show your work.

(i) LTC and LTD are tested and reported separately

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

(ii) LTC and LTD are combined for testing and reporting purposes

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

## 2.

(6 points)

- (a) (1 point) List the Academy qualifications required for issuing a Statement of Actuarial Opinion.

ANSWER:

## 2. Continued

You are a consulting actuary who has been engaged by US-domiciled ABC Health Insurer to provide a Statement of Actuarial Opinion for the NAIC health annual statement as of December 31, 2021. You have been provided all of the data files and calculations used by the opining actuary in the prior year. As part of your initial effort, you have noted the following:

- (i) ABC has a Medicare Supplement block where premiums are established by issue age and ABC is holding policy reserves. In 2021, ABC reduced these policy reserves by switching from a net level premium method to a two-year full preliminary term method (2YFPT).
- (ii) ABC started a new line of business in 2021 by selling individual health insurance policies on the ACA exchange. The CFO indicated that they have not established any provision related to risk adjustment despite the strategy of attracting healthier members.
- (iii) ABC is estimating unpaid claim liabilities for the individual health insurance line of business using completion factors from the more established Medicare Supplement line of business.
- (iv) ABC has a small block of long-term care (LTC) insurance. You noted that all assets are invested in bonds with a duration of 5 years or less. When you asked the CFO about asset adequacy analysis, they indicated that such analysis was not performed because it is not required for the NAIC Health Blank.
- (v) In 2021, ABC made major modifications to the underwriting guidelines for LTC insurance. As such, ABC changed the assumed pattern of incurred claims by duration for calculation of policy reserves for policies issued under the new underwriting guidelines.
- (vi) For ABC's group medical insurance business, they establish an explicit claim margin by subtracting 3% from each calculated completion factor for the most recent 24 months (e.g., a completion factor calculated as 95% complete would be reduced to 92% to determine the unpaid claim liability).
- (vii) ABC has a closed line of business selling Individual Disability Insurance. Policies that are issue age rated and not subject to rate increases. The sum of claims and changes in reserves has exceeded premiums for each of the last 3 years. The only liabilities you have found for this line of business are unearned premiums, unpaid claim liabilities, claim adjustment expense liability, policy reserves, and claim reserves.



## 2. Continued

- (b) *(4 points)* Assess whether any of the prescribed opinion statements have been violated for each of the items noted above. Justify your answer.

ANSWER:

ABC's CFO has certified the accuracy and completeness of all the policyholder and claim information provided to you for your analysis.

- (c) *(1 point)* Identify additional steps required pursuant to ASOP 41.

ANSWER:

### 3.

(7 points)

- (a) (1 point) Describe studies and considerations for evaluating the adequacy of claim reserves for long-term benefits.

ANSWER:
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You are determining long-term benefit reserves for your company and are given the following information regarding one of your members:

Date Of Birth	October 1, 1957
Member Disabled Since	April 1, 2022
Monthly Benefit	\$2,500
Annual Interest Rate	4%
Number Of Months In Elimination Period	3
Benefit Ends At Age	65
Benefit Payment Timing	Middle Of The Month

Continuance Table

Claim Duration (Months)	Age At Claim		
	63	64	65
0	1,000	1,000	1,000
1	975	950	900
2	950	900	800
3	925	850	700
4	900	800	600
5	875	750	500
6	850	700	400
7	825	650	300
8	800	600	200
9	775	550	100

### 3. Continued

(b) (3 points) Calculate the tabular claims reserves for the member above as of

- June 30, 2022
- July 31, 2022
- August 31, 2022

Show your work.

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

(c) (1 point) List common data integrity issues associated with long-term benefit reserves.

ANSWER:

You discover that the member has been disabled since February 1, 2022.

(d) (1 point) Calculate the sufficiency or deficiency of the reserve for this member as of July 31, 2022. Show your work.

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

You are given the following pending factors:

Durations	Pending Factor
1-4	90%
5-9	72%

(e) (1 point) Calculate the pending reserve for this member as of July 31, 2022, assuming the claim is reported and unpaid on July 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.*

**4.**  
(9 points)

- (a) (2 points) Describe considerations associated with establishing reserves for short-term benefits.

ANSWER:

You are an actuary at Creative Actuarial Consulting Company (CACC) and have been provided the dental claims data from your largest US client BigCo. A review of the data has not yet been performed.

In the Excel spreadsheet, you are provided with BigCo paid claims by incurred month from January 2020 through March 2021, along with membership and earned premium for each month. You notice a gap in data as a result of dental offices being closed from March 15, 2020 through June 15, 2020 due to the Covid-19 lockdown.

- (b) (1 point) Describe considerations for setting reserves for BigCo on March 31, 2021.

ANSWER:

- (c) (2 points) Calculate the IBNR reserve as of March 31, 2021 using the age-to-ultimate development method. Show your work.

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

- (d) (1 point) Evaluate the reasonableness of the reserve from (c) using membership and premium data. Show your work and justify your answer.

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

#### 4. Continued

BigCo requests a memorandum outlining your findings, including any limitations. CACC uses the following table to assess compliance with ASOP 23.

<b>Analysis of Issues and Recommended Practices</b>	<b>Level of Compliance</b>	<b>Recommendation for Improvement</b>
Selection of Data		
Review of Data		
Use of Data		
Reliance on Data Supplied by Others		
Reliance on Other Information Relevant to the Use of Data		
Confidentiality		

(e) (3 points)

- (i) (2 points) Assess the level of compliance for each listed consideration. Justify your answer.

ANSWER:

- (ii) (1 point) Recommend improvements to BigCo for each deficient consideration.

ANSWER:

## 5

(10 points)

- (a) (1 point) List how companies routinely use Embedded Value (EV).

ANSWER:

- (b) (2 points) Describe how to utilize the following broad categories for an analysis of movement that decomposes the change in EV.

- (i) Contribution from new business

ANSWER:

- (ii) Contribution from in-force business

ANSWER:

- (iii) Contribution from free surplus

ANSWER:

- (iv) Capital movements

ANSWER:

## 5. Continued

(c) (3 points) Assess the accuracy of the following statements regarding setting assumptions related to EV by identifying which are true or false. Justify your answer.

(i) It is appropriate to include provisions for adverse deviation for noneconomic assumptions.

ANSWER:

(ii) Noneconomic assumptions do not need to be consistent with the market's perception of these assumptions.

ANSWER:

(iii) For a company located in multiple territories, investment expenses reflect a single accounting methodology.

ANSWER:

(iv) Persistency rates are typically set by considering only a company's own experience, and not industry data.

ANSWER:

(v) It is unusual for a reinvestment assumption to be part of the investment return assumption.

ANSWER:

(vi) Two approaches commonly used for determining the risk discount rates when the cost of debt is reflected are the "top-down" approach and the "bottom-up" approach.

ANSWER:

## 5. Continued

Consider the following assumptions for a company:

Target post-tax profit as a % of 150% of MCCSR	13%
Earned pre-tax annual return on capital	5%
Tax rate	40%
Earned premium on December 31, 2021	\$5,000,000
Expected annual renewal rate increase (end of year)	7%
Expected annual lapse rate (end of year)	20%
MCCSR factor	11%
Current statistical fluctuation factor for MCCSR	75%
Discount rate	9%

Assume that all remaining policies lapse and all remaining capital is released at the end of the three-year projection period.

- (d) (4 points) Calculate the expected EV rolled forward one year to December 31, 2022. Show your work.

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



**6.**

(6 points) You are an actuary advising Sunny State Medicaid of the risk adjustment options available when implementing their Medicaid Managed Care program.

(a) (1 point) Define the following important time periods used in risk adjustment.

(i) Experience period

ANSWER:

(ii) Rate period

ANSWER:

(b) (1 point) Describe major considerations when deciding whether risk adjustment should apply to a beneficiary rate category.

ANSWER:

Sunny State is considering using either prospective or concurrent risk adjustment for its Medicaid program.

(c) (2 points) Explain the advantages of both risk adjustment methods to Sunny State.

ANSWER:

(d) (2 points) Compare and contrast the application of individual and aggregate risk adjustment factors in the calculation of a health plan's capitation rate.

ANSWER:

## 7.

(9 points)

- (a) (2 points) Define and describe a Health Maintenance Organization (HMO) and a Preferred Provider Organization (PPO).

ANSWER:

- (b) (1 point) Write down in the following chart the advantages of an HMO and PPO from each perspective:

Perspective	HMO Advantages	PPO Advantages
Member		
Provider		
Health Plan		

ANSWER:

- (c) (4 points) The “triple aim” is commonly used to describe the modern paradigm of health policy by the Centers of Medicare and Medicaid Services.

- (i) (1 point) List each element of the “triple aim.”

ANSWER:

- (ii) (3 points) Describe the characteristics of each element of the “triple aim.”

ANSWER:

- (d) (2 points) Contrast how HMOs and PPOs each meet the goals of the “triple aim.”

ANSWER:

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

**8.**

(17 points) You are an actuary for a Pharmacy Benefit Manager called Quick Scripts (QS). The clients of QS are mid-sized employers. You frequently work with the accountants at QS, including the Chief Accounting Officer (CAO).

- (a) (1 point) Describe the difference between the “accounting view” and the “actuarial view” of claims.

ANSWER:

The CAO reaches out to ask you why the year-over-year claims trend in the period Jul-Dec 2021 was so much higher than the period Jan-Jun 2021. The CAO would have expected trend in the first half of the year to be approximately the same as the second half of the year. The CAO has shared the following summary table to support their assertion.

	January – June	July – December
2020 Shipped Claims (Pharmacy Cost)	\$71.9M	\$71.8M
2021 Shipped Claims (Pharmacy Cost)	\$81.1M	\$84.0M
Year over Year Claims Trend	13%	17%

QS does not maintain any claims reserves for this book of business. Membership was unchanged across this book throughout the period Jan 2020 – Dec 2021.

The Excel spreadsheet contains the data and information the CAO used.

- (b) (4 points) Calculate the year-over-year Jan-Dec 2021 claims trend using:
- (i) Ship date

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

- (ii) Fill date

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

Show your work.

## 8. Continued

- (c) (1 point) Explain why ship date is preferred when calculating claims trend in the “accounting view”.

ANSWER:

- (d) (2 points) Explain factors that could cause the “actuarial view” of claims trend to differ from the “accounting view”.

ANSWER:

The CAO would like to understand whether the higher claims trend for Jul-Dec 2021 could have been predicted more closely with data through Jun 2021 if the team had focused on the “actuarial view”.

- (e) (4 points)
- (i) (3 points) Calculate the claims trend based on data through June 2021 using the “actuarial view”. Show your work.

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

- (ii) (1 point) Assess whether the calculated trend in part (i) would have better predicted the Jan-Dec 2021 trend. Justify your response.

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

- (f) (2 points) Create the accounting entry for Drug J3381 for the month of Nov 2021. Show your work.

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

## 8. Continued

You have received a request from the local sales manager to evaluate the profitability of their client, PQR.

(g) (2 points) Calculate the profit margin for PQR in 2021 using:

(i) Ship date.

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

(ii) Fill date.

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

Show your work.

You review ASOP 21 to determine which elements are within scope of a request for information related to a potential financial examination.

(h) (1 point) Describe the circumstances an actuary should be prepared to discuss with an examiner due to changing conditions.

ANSWER:

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

**9.**

(7 points) You are an actuary for ABC insurance company, in charge of pricing ABC's Medicare Part D plans.

- (a) (2 points) Explain the options available for employers to provide federal government subsidized drug coverage to their retirees.

ANSWER:

You are pricing ABC's defined standard prescription drug plan (PDP) for 2023. You are given the following:

Utilization Trend	0%
Drug Cost Trend (2 year factor, not annual)	10%
2023 National Average Bid	\$35
2023 Base Beneficiary Premium	\$33
2023 Expected Risk Score	1.0
2023 Defined Standard Annual Deductible	\$450
2023 Initial Coverage Limit	\$5000
2023 True Out of Pocket Cost (TrOOP) threshold	\$10,000
2023 Administrative Expenses (% of revenue)	15%
2023 Margin (% of revenue)	5% of revenue
ABC has 10 members in 2023	
All members are expected to be enrolled for the full year in 2023	
No rebates expected in 2023	
ABC's 2021 claims experience data is 100% credible for pricing in 2023	

The Excel spreadsheet contains the 2021 claims experience to be used in pricing.

- (b) (4 points) Calculate the 2023 PMPM premium for ABC's defined standard PDP. Show your work.

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

## 9. Continued

After the end of 2023, your finance department tells you that the actual paid claims for ABC's defined standard PDP for 2023 were \$80 PMPM.

- (c) (1 point) Calculate ABC's CMS risk sharing settlement for 2023. 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.*

**10.**

(13 points) You are the actuary for an insurance company adding a fully-insured retiree medical product to its portfolio of employer sponsored benefit offerings. You are working closely with the underwriting and operations departments to implement this new product. Underwriting is concerned about the cost of this product while operations is worried about the complexity of claims processing.

(a) (3 points)

(i) (2 points) Explain underwriting considerations that are common for retiree plans.

ANSWER:

(ii) (1 point) Explain claim processing considerations that are common for retiree plans.

ANSWER:

(b) (2 points) The underwriting team has very little experience with Medicare and needs to understand how this government sponsored coverage will impact pricing.

(i) Describe methods to integrate retiree coverage with Medicare benefits.

ANSWER:

(ii) Explain the impact of each method from underwriting's perspective and operations' claims processing perspective.

ANSWER:



## 10. Continued

You are pricing a retiree medical plan for Smith Rock, a company with a small group of retirees. You are given the following:

2021 claims experience for groups A-J is complete and the entire group is deemed fully credible
Retirees are placed into groups A-J based on their individual average annual cost
Retirees are enrolled in Medicare: \$1,556 annual deductible, 20% member coinsurance
Medicare coverage is expected to remain the same in 2022
Smith Rock offers secondary coverage: \$100 annual deductible, 60% employer coinsurance
In 2021 Smith Rock paid for one-quarter of the total medical claims
5 members are anticipated to move from group A to group J in 2022
In response to growing employer costs, Smith Rock will change the deductible by \$50 and the employer coinsurance level by 10% in 2022
Trend is assumed to be 7% +/- 75 basis points

The Excel spreadsheet contains Smith Rock's data and modeling.

(c) (5 points)

- (i) (4 points) Calculate a range of potential 2022 plan cost changes from 2021 actuals for each coordination of benefits method by completing the table below. Show your work.

2022 Estimated Plan Cost Change	Coordination Method		
Low			
High			

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

- (ii) (1 point) Recommend a coordination of benefits method that could support both the underwriting and operations departments. Justify your response.

ANSWER:

- (d) (1 point) Explain the impact of Medicare and other offsets that should be considered when underwriting this retiree group health benefit according to ASOP 6.

ANSWER:

## 10. Continued

You are consulting for a local government whose CFO believes in prefunding the retiree group benefit costs.

(e) (2 points)

- (i) Explain why an employer may or may not choose to prefund retiree obligations.

ANSWER:

- (ii) List less traditional funding vehicles for prefunding an employer's retiree obligations.

ANSWER:

# 11.

(8 points)

- (a) (1 point) List the goals of insurance regulation.

ANSWER:

- (b) (1 point) Describe the situations where simple regulation is preferable versus situations where complex regulation is preferable.

ANSWER:

- (c) (3 points) Outline the five categories of regulatory enforcement, including:

- (i) Definitions of each category

ANSWER:

- (ii) An example for each category showing how it is applied

ANSWER:

- (d) (1 point) Identify and define each of the types of Consumer Protection Regulations.

ANSWER:

## 11. Continued

A new island has formed just off the Atlantic coast of the United States and it has been added as the 51<sup>st</sup> state, Newer York. You chose to move to the island, where you are now the state's first Actuary. You are tasked with ensuring proper health insurance regulation.

The state legislature is determined to write some Consumer Protections into law. The following list of possible regulations were provided to you:

- Standardized summary of benefits for consumers for all medical insurers
  - Mandate illustrations of the value of the whole life policy under different scenarios
  - Strict loss ratio regulation on small group major medical insurance premiums
  - Create the state's own definition of mandated benefits for ACA plans
  - Explicit mention of exclusions in all sales materials
  - Removal of any use of prior experience to write major medical insurance, regardless of group size
  - Elimination of credit data as an allowable underwriting method for life insurers
  - Require all life insurance application forms to contain tables showing future guaranteed costs
- (e) (2 points) Identify which protections described in (d) apply to each of the potential regulations above. Justify your response.

ANSWER:
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**\*\*END OF EXAMINATION\*\***