

# Exam GHDP

**Date:** Tuesday, May 2, 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.

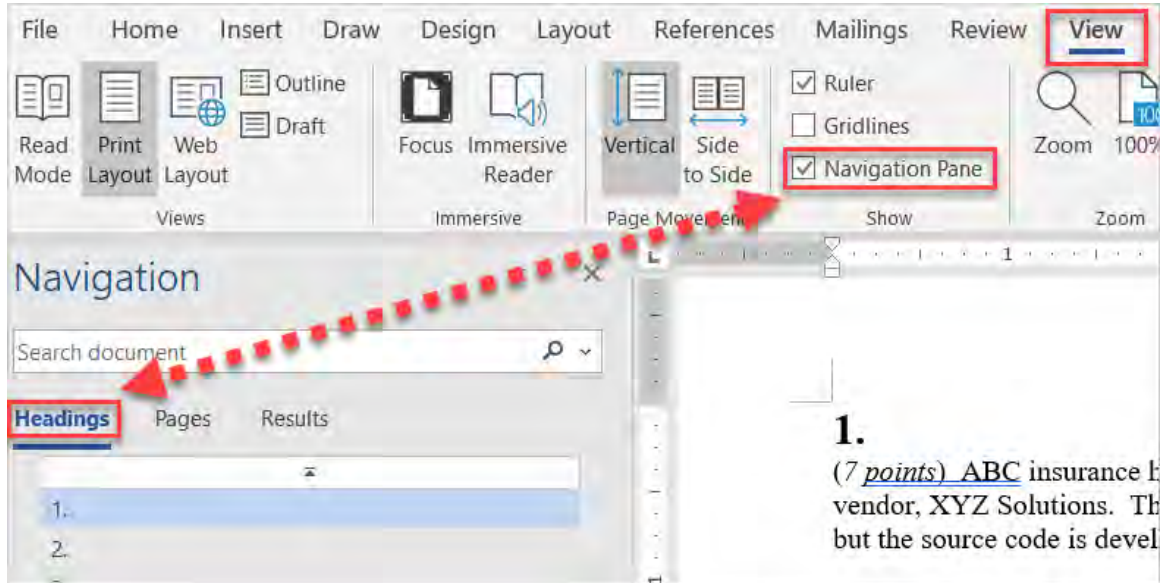
### Written-Answer Instructions

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,  $\beta_1$  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, as long as your work and assumptions are clear to an individual with average Excel experience reviewing the submitted file.
  - 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 the five-minute upload period expires.

## Navigation Instructions

Open the Navigation Pane to jump to questions.

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



# 1.

(7 points) You are an actuary for PQR Insurance, which offers individual ACA and Medicare Advantage (MA) products.

- (a) (1 point) Describe advantages and disadvantages to PQR of introducing an innovative product design.

ANSWER:

PQR has aggressive individual ACA membership growth targets. The product team proposes offering dental coverage embedded within a bronze plan targeted at families to help achieve these targets.

- (b) (1 point) Critique this proposal.

ANSWER:

To make up for a lack of Cost Share Reduction (CSR) payments, every state in which PQR offers ACA plans has instructed carriers to increase premiums on silver plans sold in the individual market.

- (c) (2 points) Explain how the following impact PQR's silver loading factor:

- (i) The state has not implemented Medicaid expansion

ANSWER:

- (ii) The state has implemented a Basic Health Plan

ANSWER:

- (iii) The state has funded additional subsidies targeted at low-income individuals

ANSWER:

**1. Continued**

(d) (3 points) Describe how the introduction of the ACA affected:

(i) Mental health parity

ANSWER:
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(ii) Enforcement of portability and conversion laws

ANSWER:
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(iii) Government funding for MA plans

ANSWER:
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## 2.

(5 points)

- (a) (1 point) Describe the key provisions of long term care (LTC) products included in the NAIC LTC Insurance Model Act and Model Regulation.

ANSWER:

- (b) (2 points) Complete the table below. For each of the assumptions:
- (i) Describe how LTC industry experience has been different from what was originally expected in the 1990s.
  - (ii) Explain why the differences may lead to the need for a rate increase.

Assumption	Variance in Experience	Reasons may lead to rate increase
Mortality		
Voluntary Lapse		
Interest Rates		
Morbidity		

- (c) (2 points) Describe how the behavior of LTC policyholders in response to a rate increase should be considered in projections of future experience.

ANSWER:

### 3.

(8 points)

- (a) (2 points) Compare and contrast level funding and ACA community rating from a rate development perspective.

ANSWER:
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Employer ABC is a manufacturing company with 47 employees. Employer ABC was acquired by Company XYZ on June 30, 20X4.

Company XYZ has a unilateral arrangement with the insurance carrier.

You are given:

Company XYZ	July 1, 20X1 - June 30, 20X2	July 1, 20X2 - June 30, 20X3	July 1, 20X3 - June 30, 20X4
Average Number of Insured Members	4,152	4,092	4,229
Paid Premium PMPM	\$250	\$275	\$300
Paid Premiums ('000s)	\$12,450	\$13,500	\$15,225
Paid Claims ('000s)	\$10,075	\$10,525	\$13,900
IBNR End of Period Reserve ('000s)	\$110	\$540	\$1,200
Pooled Premiums ('000s)	\$872	\$933	\$1,091
Pooled Claims ('000s)	\$375	\$450	\$675
Credibility Weight	1/9	1/3	5/9

Employer ABC	July 1, 20X1 - June 30, 20X2	July 1, 20X2 - June 30, 20X3	July 1, 20X3 - June 30, 20X4
Average Number of Insured Members	35	40	47
Paid Premium PMPM	\$250	\$275	\$300
Paid Premiums ('000s)	\$105	\$130	\$165
Paid Claims ('000s)	\$53	\$83	\$112
IBNR End of Period Reserve ('000s)	\$1	\$5	\$11
Pooled Premiums ('000s)	\$8	\$11	\$15
Pooled Claims ('000s)	\$3	\$5	\$7
Credibility Weight	1/9	1/3	5/9

### 3. Continued

Retention (% of Paid Premium)

Administration	5.00%
Claim Adjudication	4.00%
Premium Taxes	2.00%
Risk & Profit	3.00%

- (b) (3 points) Calculate the accumulated surplus or deficit at June 30, 20X4 including XYZ's acquisition of Employer ABC from:
- (i) The client perspective.
  - (ii) The insurer perspective.

Show your work.

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

You are Given:

Annual Claims Trend	7.00%
Annual Interest Rate	0.00%
Paid Premium PMPM for July 1, 20X4 - June 30, 20X5	\$325.00
Pooling Premium PMPM for July 1, 20X4 - June 30, 20X5	\$24.75
Pooling Premium PMPM for July 1, 20X5 - June 30, 20X6	\$27.50
Expected number of insured members for July 1, 20X5 - June 30, 20X6	4,350

- (c) (2 points) Calculate the PMPM rates for the period July 1, 20X5 to June 30, 20X6. Show your work.

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

- (d) (1 point) Evaluate whether a deficit recovery, unilateral, or bilateral arrangement would have been most beneficial to the insurance carrier. Justify your response.

ANSWER:

#### 4.

(9 points)

- (a) (2 points) List and describe the entities in the prescription drug benefits system framework.

ANSWER:
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You are an actuary working on Medicare Part D. You are helping an intern understand the legislative history of Medicare Part D, using historical claims data.

You are given:

- Claims experience for a Part D member:

Incurred Date	Drug Type	Script Count	Retail Cost
January 2	Generic	1	\$120
January 16	Brand	1	\$550
February 2	Generic	1	\$120
February 16	Brand	1	\$550
March 2	Generic	1	\$120
March 16	Brand	1	\$550
April 2	Generic	1	\$120
April 16	Brand	1	\$550
May 2	Generic	1	\$120
May 16	Brand	1	\$550
June 2	Generic	1	\$120
June 16	Brand	1	\$550
July 2	Generic	1	\$120
July 16	Brand	1	\$550
August 2	Generic	1	\$120
August 16	Brand	1	\$550
September 2	Generic	1	\$120
September 16	Brand	1	\$550
October 2	Generic	1	\$120
October 16	Brand	1	\$550
November 2	Generic	1	\$120
November 16	Brand	1	\$550
December 2	Generic	1	\$120
December 16	Brand	1	\$550



#### 4. Continued

- The Part D Standard Benefit Design parameters for 2007 and 2020:

	2007	2020
Annual Deductible	\$265	\$435
Initial Coverage Limit	\$2,400	\$4,020
<b>Donut Hole Brand Discount</b>		
Manufacturer cost share		70%
Plan cost share		5%
Member cost share	100%	25%
Donut Hole Generic Discount (Plan coins)		75%
TrOOP	\$3,850	\$6,350
Estimated Covered Rx Costs	\$5,451	\$9,719
<b>Catastrophic benefit (max 5% or copay below)</b>		
Generic or Preferred multi-source	\$2.15	\$3.60
Other Drugs	\$5.35	\$8.95

- For costs in the catastrophic phase, the Medicare reinsurance portion is attributed to plan cost share.
- (b) (2 points) Calculate the cost share, as a percentage of paid claims, using the 2007 benefit design for the:
- (i) Member
  - (ii) Health plan

Show your work.

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

#### 4. Continued

(c) (3 points) Calculate the cost share, as a percentage of paid claims, using the 2020 benefit design for the:

- (i) Member
- (ii) Health plan
- (iii) Manufacturer

Show your work.

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

(d) (1 point) Describe the impact of “closing the donut hole” on the:

- (i) Member

ANSWER:

- (ii) Health plan

ANSWER:

- (iii) Manufacturer

ANSWER:

#### 4. Continued

Assume for 2020 CMS limits the member's out of pocket cost to \$2,000 and makes no other changes to the benefit parameters.

(e) (1 point) Describe the impact to the:

(i) Member

ANSWER:

(ii) Health plan

ANSWER:

(iii) Manufacturer

ANSWER:

**5.**

(9 points)

- (a) (1 point) Describe sources of data that can be used to estimate dental claim costs.

ANSWER:
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- (b) (2 points) Describe data quality considerations when selecting, analyzing, and relying on data for the purposes of developing dental claim costs.

ANSWER:
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You are an actuary analyzing and pricing dental claims experience in the employer group market. The plan gives access to care both inside and outside its network by paying a discounted fee for service.

You are given:

Dental Plan Provision	PPO	HMO
Deductible per Member per Benefit Year		
Preferred Provider		
Class I Services	None	None
Class II and Class III Services	\$50	None
Non-Preferred Provider		
Class I Services	\$20	n/a
Class II and Class III Services	\$75	n/a
Annual Maximum per Member	\$1,500	None
Waiting Period		
Class I and Class II Services	None	None
Class III Services	12 Months	None

Dental Network - Member Coinsurance			
Class	PPO Preferred Provider	PPO Non-Preferred Provider	HMO
Class I	0%	20%	0%
Class II	10%	40%	5%
Class III	40%	70%	20%

## 5. Continued

Provider and Network Discount			
Provider	Network	PPO Discount	HMO Discount
Preferred	Narrow	35%	45%
Preferred	Broad	20%	25%
Non-preferred	N/A	5%	N/A

- Member A enrolled January 1, 20X1
- Member B enrolled January 1, 20X2

PPO Experience – 20X2					
Member	Incurred Date	Provider	Network	Procedure Class	Billed Charges
Member B	January 22	Preferred	Narrow	Class I	\$80
Member B	January 29	Preferred	Narrow	Class II	\$600
Member B	March 20	Preferred	Broad	Class I	\$50
Member A	March 22	Preferred	Narrow	Class I	\$80
Member A	March 22	Preferred	Narrow	Class I	\$50
Member B	July 24	Non-preferred	N/A	Class III	\$1,500
Member A	July 27	Preferred	Narrow	Class II	\$150
Member A	July 27	Preferred	Narrow	Class II	\$300
Member A	September 1	Preferred	Broad	Class III	\$1,100
Member A	October 8	Preferred	Narrow	Class III	\$2,500
Member B	November 22	Non-preferred	N/A	Class II	\$750

- (c) (4 points) Calculate the 20X2 PPO member and plan liability for:
- Member A
  - Member B

Show your work.

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

You are given:

HMO Plan Assumptions	
Annual utilization trend	4%
Annual unit cost trend (Narrow network)	6%
Annual unit cost trend (Broad network)	8%
Narrow network utilization	80%
Broad network utilization	20%
Non-benefit expense ratio (% of Premium)	10%
Profit margin (% of Premium)	5%

HMO Plan Utilization and Unit Cost in 20X2			
Class	Annual Services per 1,000 Members	Narrow Network: Average Cost per Service	Broad Network: Average Cost per Service
Class I	4,500	\$85	\$120
Class II	1,500	\$250	\$350
Class III	500	\$2,500	\$3,000

- (d) (2 points) Calculate the 20X4 HMO premium. Show your work.

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

**6.**

(8 points)

- (a) (1 point) Describe the primary differences between Short-term Disability (STD) and Long-term Disability (LTD) coverage.

ANSWER:

- (b) (2 points) Recommend changes to stand-alone STD and stand-alone LTD offerings under the following scenarios. Justify your response.

- (i) The state recently passed legislation implementing statutory disability plans.

ANSWER:

- (ii) The Sales team decides to package STD and LTD benefits into one offering.

ANSWER:

You are given the following for UVW Insurance Company's group disability business:

20X1 Experience and Rating Factors

Non-Claim Expenses	
Admin Costs	\$1,100,000
Claim Adjudication Costs	\$280,000
Commissions	\$1,000,000
Premium Taxes	\$200,000
Expected Risk Profit (% of Premium)	5%

## 6. Continued

20X1 Experience by Area			
	Factor	Premium ('000s)	Claims ('000s)
NE	1.00	\$2,300	\$1,400
SE	1.10	\$1,700	\$1,400
MW	0.95	\$2,000	\$1,900
West	1.10	\$1,250	\$1,100
SW	1.00	\$2,750	\$1,700
Total		\$10,000	\$7,500

20X1 Experience by Group Size			
	Factor	Premium ('000s)	Claims ('000s)
<=25	1.05	\$1,000	\$850
26 - 50	1.00	\$1,500	\$1,500
51-100	1.00	\$2,000	\$1,600
101-500	0.95	\$2,000	\$1,700
500+	1.10	\$3,500	\$1,850
Total		\$10,000	\$7,500

- 20X2 Premiums are \$10,500,000

### 20X3 Rating Assumptions

Experience Weight Prior Rating Factors	90%
Credibility on 20X1 Claims	100%
Expected Claims Trend	3%

- (c) (3 points) Calculate the 20X3 premium change needed for a 75-member group in the MW region. Show your work.

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



**6. Continued**

(d) (2 points)

- (i) Critique the appropriateness of the experience weight of the prior rating factor assumption.

ANSWER:

- (ii) Describe the implications of placing less weight on the prior rating factors for a 75-member group in the MW region.

ANSWER:

## 7.

(8 points)

- (a) (1 point) List and describe the steps of the product development cycle.

ANSWER:

- (b) (1 point) Describe plan provisions that help mitigate moral hazard and financial risks in basic group term life insurance plans.

ANSWER:

- (c) (1 point) Describe tax implications in basic group term life for the:

- (i) Employer

ANSWER:

- (ii) Employee

ANSWER:

## 7. Continued

You are an actuary developing a new basic group term life product.

(d) (1 point) Describe considerations for the following elements of gross premium development:

(i) Estimated claims cost

ANSWER:

(ii) Administrative costs

ANSWER:

(iii) Commissions

ANSWER:

(iv) Risk and profit charges

ANSWER:

## 7. Continued

You are developing the group term life premium for Company JKL with an April 1 effective date. The monthly claim rate is from an industry study completed over 10 years ago. You are given:

Company Census	
Male employees	100
Female employees	550

Pricing Factors	
Area	0.90
Effective date (April 1)	0.97
Industry	1.05
Case size	0.95

Pricing Assumptions	
Commissions (% of gross premium)	10%
Profit Target (% of gross premium)	5%
Expense target (% of net premium)	15%
Premium tax (% of gross premium)	2%

Monthly Claim Rate and Annual Insured Amount		
Age	Monthly Claim Rate per \$1,000 Coverage	Company Insured Amount ('000s)
>25	0.041	\$1,460
25-29	0.049	\$2,250
30-34	0.057	\$3,000
35-39	0.075	\$5,650
40-44	0.111	\$4,520
45-49	0.174	\$6,000
50-54	0.271	\$3,800
55-59	0.420	\$2,520
60-64	0.565	\$4,010
65-69	0.925	\$1,890
70-74	1.665	\$1,550
<75	4.165	\$ 980

## 7. Continued

- (e) (3 points) Calculate the:
- (i) Net manual claim cost.
  - (ii) Gross premium claim cost.

Show your work.

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

- (f) (1 point) Recommend two improvements to the rate development. Justify your response.

ANSWER:

## 8.

(9 points)

- (a) (1 point) List and describe rating factors used when projecting pharmacy experience.

ANSWER:

- (b) (1 point) Explain how an increased discount on Average Wholesale Price (AWP) can have a varying impact on member cost share and plan liability.

ANSWER:

You are analyzing the required premium increase for Company DEF from 20X2 to 20X3.

You are given:

Estimated allowed drug cost PMPM (20X2)	\$100.00
Drug discount (20X2)	73.0%
Drug discount (20X3)	75.0%
Dispensing fee (20X2)	\$5.00
Dispensing fee (20X3)	\$3.00
Rebate (% of allowed amount)	3.0%
Member coinsurance	20.0%

- (c) (1 point) Calculate the change in the allowed amount due to the changes in contracting. Show your work.

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

- (d) (2 points) Calculate the change in the effective member cost sharing due to the changes in contracting. Show your work.

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

## 8. Continued

You are given:

Annual claim cost trend	10%
Expenses (% of premium)	15%
Target profit (% of premium)	5%

- (e) (2 points) Calculate the 20X3 premium PMPM. Show your work.

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

- (f) (1 point)

- (i) List formulary management programs that can impact expected cost and utilization.

ANSWER:

- (ii) Describe the advantages and disadvantages for each program.

ANSWER:

Company DEF's management is concerned about the impact increasing trend will have on premium. Additionally, given a tight labor market, DEF is concerned with the employee experience.

- (g) (1 point) Recommend a formulary management program for DEF. Justify your response.

ANSWER:

## 9.

(7 points)

(a) (2 points) Recommend whether each of the following businesses should fully insure or self-insure their health benefits. Justify your response.

(i) A chain store with locations across the country, with more than 500 retail and corporate employees.

ANSWER:

(ii) A small boutique with a dozen employees looking to reduce costs.

ANSWER:

(iii) A company with over 500 employees and seasonal spikes in revenue.

ANSWER:

(b) (1 point) Describe the effects which magnify the trend for stop-loss coverage compared to overall trend.

ANSWER:



## 9. Continued

You are an actuary for LMN Insurance, which specializes in selling stop loss coverage. Big Customer has a specific stop loss policy with a \$100,000 deductible that covers medical and pharmacy claims. Big Customer has stated they will not renew for 20X4 unless the rate increase is under 10%.

You are given the following 20X3 claims probability distribution per employee per year.

Range of Claims PEPY	Frequency	Inpatient	Outpatient	Physician	Non- Specialty Drugs	Specialty Drugs	Total
\$0	0.18987	\$0	\$0	\$0	\$0	\$0	\$0
\$1-\$100	0.05000	0	15	23	13	0	51
\$101-\$500	0.23280	25	89	66	45	16	241
\$501-\$1,000	0.15000	272	145	113	87	105	722
\$1,001-\$5,000	0.14000	824	538	529	245	519	2,655
\$5,001-\$10,000	0.12400	1,902	960	1,200	352	750	5,164
\$10,001-\$25,000	0.04510	9,837	2,937	1,969	483	1,653	16,879
\$25,001-\$50,000	0.03750	21,345	7,634	4,524	872	3,567	37,942
\$50,001-\$100,000	0.02275	36,421	9,360	7,202	1,265	23,232	77,480
\$100,001- \$250,000	0.00627	74,532	41,576	13,610	2,959	36,323	169,000
\$250,001- \$500,000	0.00100	205,362	104,217	17,306	5,623	53,963	386,471
\$500,001- \$1,000,000	0.00070	436,352	144,165	24,532	12,634	150,692	768,375
\$1,000,000+	0.00001	870,256	252,663	30,576	36,324	435,695	1,625,514
					Average PEPY		\$7,126

## 9. Continued

You are given the service category trends below. Contracting for specialty drug reimbursement is still in negotiations.

	Annual Trend
Inpatient	3%
Outpatient	4%
Physician	4%
Non-Specialty Drugs	1%
Specialty Drugs	To Be Determined

Administrative cost and other retention items do not impact the calculation.

- (c) (3 points) Calculate the maximum annual trend for Specialty Drugs to meet Big Customer's rate increase target. Show your work.

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

Due to the expected release of a new blockbuster drug in 20X4, LMN is unable to meet Big Customer's rate increase target.

- (d) (1 point) Recommend two changes to policy provisions that could reduce the rates. Justify your response.

ANSWER:

**\*\*END OF EXAMINATION\*\***