

EXAM CP 321

Date: Friday, March 27, 2026

INSTRUCTIONS TO CANDIDATES

General Instructions

1. This assessment has 9 questions numbered 1 through 9 with a total of 50 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.

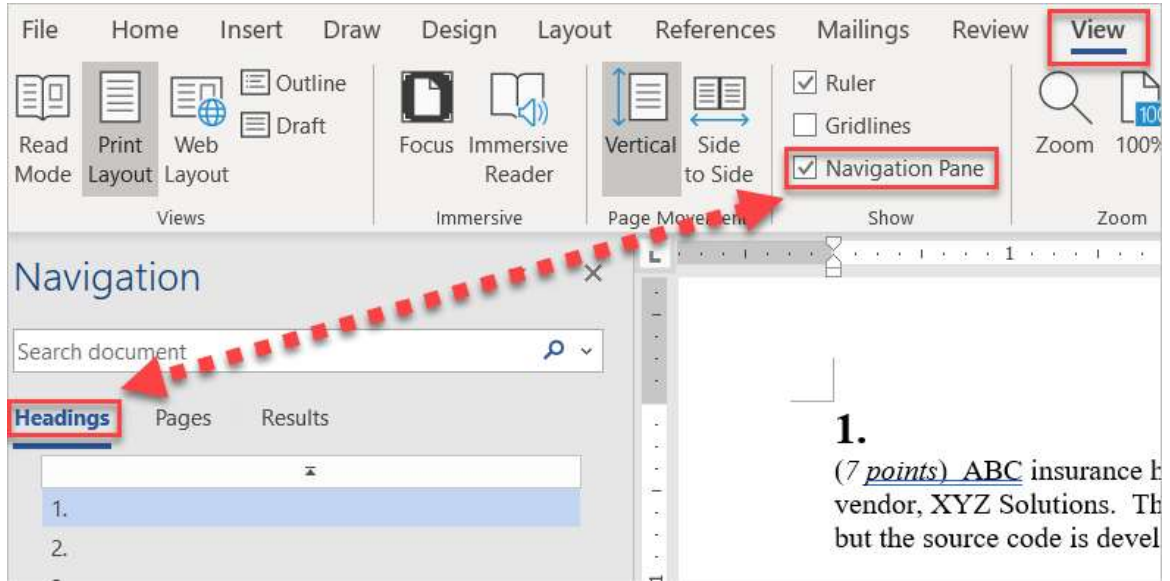
Written-Answer Instructions

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:



1.

(4 points)

(a) *(1 point)*

- (i) List the most common “100 percent benefit” triggers for critical illness policies.

ANSWER:

- (ii) List the most common partial benefit triggers for critical illness policies.

ANSWER:

- (iii) List two emerging benefit triggers for critical illness policies.

ANSWER:

- (b) *(3 points)* Describe the key actuarial, regulatory, marketing, and operational differences among the three primary types of critical illness policies available in the United States.

ANSWER:

2.

(5 points) You are building a cashflow model to support your company's asset liability management (ALM) activities. The company holds material reserves and liabilities for three blocks of business: Attained-age-rated Medicare Supplement, group Long-Term Disability (LTD), and individual Long-Term Care (LTC).

(a) (2 points) Describe the key assumptions and decisions involved in modeling:

(i) (1 point) Asset cashflows.

(ii) (1 point) ALM interactions.

ANSWER:

(b) (1 point) Describe inputs from key non-actuarial teams that are important to the success of the ALM model build.

ANSWER:

(c) (2 points) For each of your company's blocks of business:

(i) (1 point) Identify and describe an analysis method used to evaluate the adequacy of the reserves and liabilities.

(ii) (1 point) Explain whether an ALM model is needed for each analysis method identified in (c)(i).

ANSWER:

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

3.

(10 points) Your Canadian client provides a retiree life insurance benefit of \$50,000. They are considering options to replace this benefit in order to end their retiree obligations earlier.

One such option is to replace the life insurance benefit with a Health Care Spending Account (HCSA). The HCSA would provide the retiree with a flat amount of dollars annually for their healthcare expenditures. The retiree would be eligible for this benefit from the time of their retirement until reaching age 65.

In the Excel spreadsheet, you are provided with an employee profile and other relevant information.

- (a) (5 points) Calculate the defined benefit obligation (DBO) for the employee's life insurance benefit as of December 31, 20X5. State any assumptions made and show your work.

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

Your client will replace the life insurance benefit with the HCSA if the DBO does not increase.

- (b) (2 points) Calculate the maximum annual HCSA contribution for the employee that achieves your client's objective. State any assumptions made and show your work.

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

In the Excel spreadsheet, you are provided with your client's yield curve.

- (c) (2 points) Using your client's yield curve:
- (i) (1 point) Calculate the revised life insurance DBO. Show your work.

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

- (ii) (1 point) Calculate the revised maximum annual HCSA contribution that would achieve your client's objective. Show your work.

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

3. Continued

- (d) *(1 point)* Describe two other strategies the employer may consider to end their retiree obligations earlier.

ANSWER:

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

4.

(5 points) Your company has a block of Long-Term Care (LTC) policies that has a duration of 25. One of the company's goals for asset liability management (ALM) is to have the duration of its equity to be between -2 and 5.

The company's asset manager recommends purchasing 10-year private bonds for the asset portfolio.

- (a) (1 point) Describe risks in the asset manager's recommendation if interest rates change over the next 10 years.

ANSWER:

Your company acquires a closed block of Individual Disability Insurance (IDI) business that has a duration of 10.

In the Excel spreadsheet, you are provided with relevant information.

- (b) (3 points) Calculate the leverage ratio and the equity duration for each block of business based on:
- (i) A proportional asset allocation.
 - (ii) A disproportional asset allocation that meets the company's goals for ALM.

State any assumptions made and show your work.

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

- (c) (1 point) Recommend an allocation of assets to the IDI and LTC blocks of business based on your calculations from part (b). Justify your responses.

ANSWER:

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

5.

(8 points) You are the actuary for your company's Long-Term Care (LTC) block. All LTC policies were sold from 2006 through 2010.

In the Excel spreadsheet, you are provided with relevant information.

- (a) (1 point) Calculate the Premium Deficiency Reserve (PDR) on a standalone basis. State any assumptions made and show your work.

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

- (b) (3 points)

- (i) (2 points) Calculate the maximum justified rate increase under the 58/85 Test. State any assumptions made and show your work.

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

- (ii) (1 point) Calculate the PDR assuming the rate increase calculated in (b)(i) is implemented. State any assumptions made and show your work.

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

Your boss provides you with the following actual-to-expected results from your company's voluntary lapse experience study for the same block of LTC:

Duration (Years)	Actual Lapse Rate	Expected Lapse Rate	Credibility
< 10	2.04%	1.80%	98%
10+	0.84%	1.00%	92%
Total	1.44%	1.40%	100%

5. Continued

(c) (3 points)

(i) (2 points) Propose changes to the expected voluntary lapse rate assumptions. Justify your proposal.

ANSWER:

(ii) (1 point) Assess how the proposed assumption from (c)(i) would impact the justified rate increase calculated in (b)(i).

ANSWER:

(d) (1 point) List four key considerations for the Multistate Actuarial committee's review of LTC rate increases.

ANSWER:

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

6.

(3 points) You are working on the group Short-Term Disability (STD) renewal for a division of a manufacturing company located in the midwestern United States.

This division opened five years ago with 600 employees. At the time, your company charged this division its base manual rate. As overall experience from this region and industry have deteriorated, your company now employs adjustment factors that were independently calibrated in its manual rating, without revision to the base manual premium rate.

In the Excel spreadsheet, you are provided with relevant information.

- (a) (2 points) Calculate the required renewal increase for this group. State any assumptions made and show your work.

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

- (b) (1 point) Explain how your company could modify its pricing methodology to increase its competitiveness for this group.

ANSWER:

7.

(3 points) You are an actuary working for a large international life and health insurance company.

- (a) (1 point) Describe the process an actuary should follow when performing asset adequacy analysis.

ANSWER:

- (b) (2 points) Identify an appropriate asset adequacy analysis method for each of the following products. Justify your response.

- An issue-age rated Medicare Supplement plan. Assets backing the products are separated from other lines of business.
- A group short-term disability plan for a small-sized organization. The block of business is backed by short-duration, low-risk assets.
- An accidental death and dismemberment plan. The company has set up a high provision for adverse deviation in the reserves and liabilities.

ANSWER:

8.

(6 points) You are estimating the incurred but not reported (IBNR) reserve for your company's Medicare Supplement block for the most recent year.

The company has historically used the Loss Ratio method for IBNR estimation, but is considering adoption of the Bornhuetter-Ferguson method.

You are provided with the following information:

- Paid claims: \$2,500,000
- Expected loss ratio: 75%
- Earned premium: \$8,000,000
- Completion factor: 60%

(a) (1 point) Calculate the IBNR under the Loss Ratio method. State any assumptions made and show your work.

ANSWER:

(b) (1 point) Describe the differences between the Loss Ratio method and the Bornhuetter-Ferguson method.

ANSWER:

(c) (2 points) Describe Medicare Supplement consumer protections commonly found in state laws and the NAIC Model Act.

ANSWER:

(d) (2 points) Describe situations in which your company may need to recognize a premium deficiency reserve for its Medicare Supplement block.

ANSWER:

9.

(6 points)

(a) (1 point)

- (i) List the activities of daily living typically included in a Long-Term Care (LTC) insurance policy.

ANSWER:

- (ii) Describe the benefit triggers for a tax-qualified LTC policy under HIPAA.

ANSWER:

(b) (2 points) Describe:

- Key assumptions used to project LTC experience.
- How decreasing each assumption would impact the future loss ratio.

ANSWER:

You are a pricing actuary analyzing experience for a 10-year-old LTC insurance block. New members of your team make the following statements:

- Statement 1: *“We need to increase premium rates for this block. However, waiting to increase them in the future will have the same financial impact.”*
- Statement 2: *“The historical loss ratio is well below 60%, so the block is generating profits.”*
- Statement 3: *“We are unable to update assumptions for future claims until we have more credible historical incurred claims data.”*

(c) (3 points) Critique each statement.

ANSWER:

****END OF EXAMINATION****