
SOCIETY OF ACTUARIES
Group & Health Specialty Exam

Exam GHSPC

Date: Tuesday, November 1, 2016

Time: 2:00 p.m. – 4:15 p.m.

INSTRUCTIONS TO CANDIDATES

General Instructions

1. This examination has a total of 40 points.

This exam consists of 4 questions, numbered 1 through 4.

The points for each question are indicated at the beginning of the question.
2. Failure to stop writing after time is called will result in the disqualification of your answers or further disciplinary action.
3. 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 on the exam booklet.

Written-Answer Instructions

1. Write your candidate number at the top of each sheet. Your name must not appear.
2. Write on only one side of a sheet. Start each question on a fresh sheet. On each sheet, write the number of the question that you are answering. Do not answer more than one question on a single sheet.
3. The answer should be confined to the question as set.
4. When you are asked to calculate, show all your work including any applicable formulas.
5. When you finish, insert all your written-answer sheets into the Essay Answer Envelope. Be sure to hand in all your answer sheets because they cannot be accepted later. Seal the envelope and write your candidate number in the space provided on the outside of the envelope. Check the appropriate box to indicate Exam GHSPC.
6. Be sure your written-answer envelope is signed because if it is not, your examination will not be graded.

Tournez le cahier d'examen pour la version française.

****BEGINNING OF EXAMINATION****

- 1.** (13 points) You are part of a product design team looking to create a new standalone critical illness insurance (CII) product.
- (a) (1 point) Define CII.
 - (b) (1 point) List areas of specific concern in product design of CII, giving attention to risk management and control aspects.
 - (c) (1 point) Describe how CII coverage would augment
 - (i) Disability Income Insurance
 - (ii) Life Insurance
 - (d) (1 point) Identify reasons why a cash flow test should be completed.
 - (e) (2 points) Describe items an actuary should consider in forming an opinion as to whether an asset adequacy analysis is satisfactory.
 - (f) (3 points) Describe considerations related to developing, reviewing, and maintaining models used in risk evaluation.
 - (g) (4 points)
 - (i) Describe all risk identification techniques, including the advantages or disadvantages of each.
 - (ii) Recommend a risk identification technique that is most appropriate for CII product development. Justify your answer.

2. (12 points) You are an actuarial consultant specializing in risk adjustment. You and XYZ Insurance Company are discussing various strategies to better manage their block of business.

(a) (4 points) Describe CMS' considerations in developing risk adjustment scores for the CMS-HCC (Hierarchical Condition Categories) Risk Model.

(b) (3 points) You have obtained the following information about the Company's Medicare Advantage business:

- Year: 2016
- County: Smith
- XYZ Member Months in Smith County: 200,000
- CMS Standardized A/B Benchmark: \$540 PMPM
- XYZ Standardized A/B Bid (Expected): \$530 PMPM
- XYZ Standardized A/B Bid (Actual): \$545 PMPM
- XYZ Expected Risk Adjustment Score: 1.50
- XYZ Actual Risk Adjustment Score: 1.25
- XYZ Member Premium: \$20 (a.k.a., Supplemental Member Premium)

(i) Calculate the expected total payment. Show your work.

(ii) Calculate the actual total payment. Show your work.

(c) (5 points) The Company is considering three models for provider reimbursement: Diagnostic Related Groups (DRGs) model, Episode Treatment Groups (ETGs) model, and DxCG model.

Describe each model's

(i) calibration population

(ii) data requirements

(iii) model structure

3. (9 points)

- (a) (2 points) Describe considerations for the two most significant reserves in disability income (DI) insurance.
- (b) (1 point) List four principal factors that would stimulate product development of a new DI product.
- (c) (2 points) ABC Insurance Company has only the following in force DI products:

Type of Coverage	Earned Premium (Million)	Claim Reserves (Million)
Non-Cancelable Individual DI Coverage	\$30	\$250
Guaranteed Renewable Individual DI Coverage	\$30	\$200
Group Long Term Disability (LTD) Coverage	\$40	\$300

- (i) Calculate the NAIC Underwriting Risk (H_2) for this portfolio. Show your work.
 - (ii) Calculate the additional H_2 required if the company estimates it will sell an additional \$20 Million in Earned Premium for a new Group LTD product. Show your work.
- (d) (4 points) ABC Insurance Company needs to fulfill their Own Risk and Solvency Assessment (ORSA) requirements.
- (i) Describe key methodologies, assumptions, and considerations used in quantifying available capital and risk capital that should be outlined in Section 3 of an ORSA Financial Summary Report.
 - (ii) Identify an example from each consideration from part (i) that is used in evaluating a new DI product.

4. (6 points) You are a consulting actuary and are being asked to give guidance on the embedded value for a company offering only group life insurance.

The following statements were made by the company's actuary during your consultation:

- I. The embedded value is the valuation of the company's in-force value without taking into account its capacity to generate new business.
- II. The best estimate liabilities are given no value in the embedded value calculation.
- III. In an embedded value calculation, the total capital earns the hurdle rate.
- IV. A good way to base management compensation is on the change in embedded value.

- (a) (2 points) Critique the accuracy of each statement.

You are provided the following information as of 12/31/2016:

- Embedded Value = \$1,250,000
- Free Capital = \$100,000
- $PV(\text{HurdleRate} \times \text{Capital}) = \$90,000$.
- $PV(\text{AfterTaxInvIncomeOnCapital}) = \$50,000$.
- The company's $PV(\text{AfterTaxProfits})$ are 70% of the LockedInCapital.

- (b) (3 points) Calculate the $PV(\text{AfterTaxProfits})$. Show your work.

You are further provided the following information for 2017:

- Company's hurdle rate = 9%
- After tax investment income rate on capital = 5%
- The company has no new sales
- Normal Increase in EV = \$108,500
- A dividend of \$50,000 was paid
- A share buy-back program was completed for \$200,000

- (c) (1 point) Calculate the Embedded Value as of 12/31/2017 with these assumptions. Show your work.

****END OF EXAMINATION****

USE THIS PAGE FOR YOUR SCRATCH WORK

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