

November 2001- Course 8M
Society of Actuaries

****BEGINNING OF EXAMINATION****
MORNING SESSION

Questions 1 – 6 pertain to the Case Study
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- 1.** (6 points) You have been provided the claims department statistics for Wonderful Life as shown in Tables MM – 5a and MM – 5b.
- (a) Explain why keeping claims inventory records is important for Wonderful Life.
 - (b) Assess the strengths and weaknesses of Wonderful Life’s claim status reports.
 - (c) Describe potential e-commerce functions and technologies that Wonderful Life might implement to increase claims processing efficiency.
 - (d) Describe critical factors for the successful implementation of an e-commerce strategy.

Questions 1 – 6 pertain to the Case Study
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- 2.** (8 points) You were recently hired as the financial actuary for Wonderful Life. Your first project with the company involves a 3-year financial forecast.

In addition to information in the case study, you are given the following:

Annual Claims Trend = 15.4%

Monthly Claims Trend = 1.2%

July Seasonal Factor = .90

Seasonal Normalization Factor = 1.000

Projected Premium for January 2001 = \$165,000,000

Projected Members for January 2001 = 980,000

Assumed Loss Ratio = .78

- (a) Discuss phases of a sound financial management process.
- (b) Describe methods commonly used to project claims costs and the conditions under which each method may be appropriate.
- (c) Calculate the Per Member Per Month (PMPM) claims cost for January 2001 under each of the four commonly used methods.
- (d) Recommend one of the four methods for Wonderful Life to develop their financial forecasts. Justify your recommendation.

Questions 1 – 6 pertain to the Case Study
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- 3.** (13 points) You are a group underwriter for Wonderful Life in the Major Medical Division. You have obtained the following data for Groups 2 and 3 in addition to the information already included in Table MM – 2 and MM – 3:

Additional Data for Experience Period July 1, 1999 through June 30, 2000

	Annual Exposure Total EEs	Total Claims
Group 2	120	\$216,000
Group 3	225	\$518,000

Total claims have not been reduced for large claims greater than \$50,000.

- (a) Describe various methods of pooling claims experience data that could be used in developing experience rates.
- (b) Discuss considerations involved in determining the credibility of a group's experience in the rate setting process.
- (c) Calculate the composite renewal premium rate per employee for each of Group 2 and Group 3 using only the data in the case study. Show your work.
- (d) Recalculate the composite renewal premium rate for each of Group 2 and Group 3 using a multi-year approach. Use the additional claims data provided above and assume an equal weighting for each year of data. Show your work.
- (e) Describe other considerations applicable when underwriting a particular employer group that could affect the accuracy of your rate calculations.

Questions 1 – 6 pertain to the Case Study

4. (7 points) You are the Valuation Actuary for the Major Medical Division of Wonderful Life.

- (a) Describe common methods you might apply to estimate medical claim reserves.
- (b) Calculate the outstanding liability as of December 31, 2000, for hospital claims incurred from October 2000 through December 2000. Assume the claims payment pattern for hospital claims incurred in January 1998 is representative of future payment patterns. Show your work.
- (c) Calculate the portion of the above outstanding liability expected to be paid by March 31, 2001. Use the same assumptions as in (b) above. Show your work.

5. (6 points) For the past few years, Wonderful Life has seen its claim expenses grow at a faster rate than its premium revenue, leading to a decreasing operating margin. In this competitive environment, measuring claim cost trends and forecasting future trends in the health insurance industry is crucial to accurate pricing.

You have been asked by the President of Wonderful Life to provide additional information on medical expense trend to help him understand the situation.

- (a) Define trend, its use, and its components.
- (b) Discuss various techniques which can be used to analyze trend and common problems encountered in trend analysis.
- (c) Calculate the component of total trend attributable to deductible leveraging given that total projected 2001 medical trend is 12%. Assume that the mix of business by plan in Table MM – 3 and base manual claim rate in Table MM – 2a are representative of all of Wonderful Life’s major medical business and are not expected to change. Show your work.

Questions 1 – 6 pertain to the Case Study

- 6.** (5 points) The Chief Operations Officer at Wonderful Life has returned from a seminar where she attended a session on C-2, Insurance Risk. She is concerned about the impact risk-based capital can have on growth. As the Chief Actuary at Wonderful Life you have been asked to discuss these issues with the COO.
- (a) Discuss characteristics used to determine the level of required surplus for insurance risk
 - (i) for insurance companies in general, and
 - (ii) specifically for the four primary business divisions of Wonderful Life
 - (b) Discuss the relationships among growth, profit, and required surplus for C-2 Insurance Risk.

7. (4 points) As a consulting actuary, you have been hired by a managed care organization to measure its medical effectiveness.

- (a) Describe the challenges of using data to produce management information and how they relate to Actuarial Standards of Practice.
- (b) Describe your considerations for evaluating health plan performance measurement criteria with regard to:
 - (i) data sources; and
 - (ii) measurement process.

8. (7 points) ABC Life insurance company plans to enter the long term care market. You have been asked to develop pricing for a new long term care product.

- (a) Identify general sources of data available to actuaries when pricing any new product line and explain the cautions which should be taken in using them.
- (b) Describe assumptions necessary to price the long term care product, and how the Actuarial Standards of Practice will influence your development of those assumptions.
- (c) When developing financial reporting related to the long term care product,
 - (i) Describe the various financial statement liabilities you need to consider; and
 - (ii) Describe the methods that maybe used to estimate each.

- 9.** (4 points) You have been asked to draft a report which details the various ways that profit and growth may be measured at your company.
- (a) Discuss methods of measuring growth.
 - (b) Discuss methods of measuring profit.
 - (c) Calculate the pre-tax underwriting gain required to achieve an 18% Return on Equity given the following assumptions:
 - capital + surplus = 20% of premiums
 - reserves + capital + surplus = 30% of premium
 - investments earn 5% after tax
 - your company is in the 37% tax bracket

Show your work.

****END OF EXAMINATION****
MORNING SESSION

****BEGINNING OF EXAMINATION ****
AFTERNOON SESSION
Beginning With Question 10

10. (3 points) You have been asked to review claims operations at a health insurance carrier.

- (a) Describe basic information requirements necessary for the proper handling of health claims.
- (b) Describe the health claim adjudication process.

11. (6 points) You are the consulting actuary for Smith Corporation. Due to increasing claims costs, your client wants to review the current noncontributory dental program offered to its employees which includes:

Benefits	
Deductible	\$25 individual /\$50 family
Coinsurance	
• preventive	100%
• basic	100%
• major	80%
• orthodontics	60%

The Corporation is thinking of incorporating dental coverage into a flexible benefits program currently under development.

- (a) Outline design changes for the current free-standing dental plan that can be used to reduce costs and explain how the changes would apply to the current plan.
- (b) Describe cost and anti-selection issues in the design of a flexible benefits program, including design features that could be used to alleviate these issues if dental is included in the flexible benefit program.

- 12.** (6 points) You are an actuary for a large reinsurer. You have been asked to provide Company ABC with a reinsurance quote. Company ABC is a medium size disability company which has recently developed a new LTC product and recently acquired a group major medical block of business. In recent years, Company ABC has been unable to achieve its corporate profit objectives.
- (a) Identify the reinsurer's underwriting considerations in evaluating whether to offer a reinsurance program to Company ABC.
 - (b) Describe the sources of risk inherent in each of Company ABC's product lines.
 - (c) Design a reinsurance program for Company ABC that will address the sources of risk for each of Company ABC's product lines. Justify each recommendation.
- 13.** (5 points) You are the group benefit consultant for a U.S. company that offers different managed care plans to its employees. Over the last few years, the employer has noticed that costs have increased rapidly and that employee dissatisfaction is growing. You have to prepare a report to explain a substantial increase in premium rates.
- (a) Describe the major drivers of consumerism in the health care industry.
 - (b) Describe other current managed care trends and indicate which of these might contribute to the cost increase.
 - (c) Describe approaches the employer could use to mitigate this rate increase.

Questions 14 through 16 pertain to the Case Study

14. (11 points) It is currently late in the year 2000. As The Bedford Group's pricing actuary, you must prepare manual rates for 2001. In addition to data from Table MC – 6, you have decided to use the following assumptions:

- Calendar year 2000 will be used as the experience period
- Anticipated increase in average charge per service from 2000 to 2001
 Hospital Services = 10%
 Physician Services = 5%
 All Other Services = 15%
- Administrative Costs will increase by 4%
- Adjustments for risk sharing, bonus, and withhold arrangements will not affect the currently reported results
- Average charges per service are the same for the HMO and POS products
- Utilization changes occur uniformly for both the HMO and POS

(a) Using the information provided:

- (i) (3 points) Calculate the expected PMPM hospital inpatient costs for the HMO and POS plans separately for 2001. Show your work.
- (ii) (1 point) Determine the required total premium PMPM assuming the total projected claims costs for 2001 are \$170.00 and \$185.00 PMPM for the HMO and POS products respectively. Show your work.

(b) (4 points) The head of the Marketing Department has to present a quote effective January 1, 2001 for the HMO product to a prospect, Bailey Industries. He has indicated three-tier premium rates are required.

Current Rate Information for Bailey Industries				
Tier	Number of Contracts	No. of Persons per Contract	HMO Ratio to Single	POS Ratio to Single
Single	35%	1.0	1.0	1.0
Two Party	15%	2.0	1.9	1.7
Family	50%	3.8	3.5	4.2

14. Continued

- (i) Calculate the manual premium rates by tier for Bailey Industries using HMO rate relativities in the table above and the total premium you calculated in (a) (ii) above. Show your work.
 - (ii) Bailey Industries requires that the HMO premium rates be recalculated using the POS rating relativities. Develop revised rates to meet this requirement. Explain why offering HMO premium rates that mirror the POS rating slope may or may not be in Bailey Industries' best interest. Show your work.
 - (iii) Describe the documentation you would include in your files to demonstrate that Actuarial Standards of Practice concerning HMOs or other managed care health plans were followed in your work.
- (c) *(3 points)* Outline a report for Bailey Industries explaining the potential impact of adverse selection resulting from the following types of market reform:
- (i) Insurer Rules of Issue,
 - (ii) Government mandated benefits and laws,
 - (iii) Rating methodologies, and
 - (iv) Marketing practices.

Questions 14 through 16 pertain to the Case Study

- 15.** (14 points) You are an actuary for The Bedford Group. A meeting has been called to address spiraling costs in two areas: behavioral health/chemical dependency and radiology services.

Radiological Services

Your CEO also has concerns regarding the increase in radiology costs even though utilization has decreased. The VP of Provider Contracts is predicting a 25% increase in 2001 in physician radiology average charges. None of the benefit plans sold require any member cost sharing for physician radiology benefits.

Behavioral Health and Chemical Dependency (BH/CD)

Your CEO is considering carving-out all BH/CD services due to increasing costs and increased regulatory pressures. Total claims for BH/CD services in 2000 were \$24 million for both HMO and POS products.

Lighthouse Behavioral Services (LBS), a managed behavioral health company, has approached The Bedford Group to provide the full continuum of care for BH/CD services. LBS will provide all BH/CD services on a capitated basis. After reviewing The Bedford Group's 2000 BH/CD claims, LBS believes they can affect BH/CD claim costs under the following assumptions:

- LBS uses The Bedford Group provider contracts
 - Utilization of services in Hospital ID1 will not change
 - Utilization of services at Hospital ID2 and ID3 will be reduced by 50%
 - 80% of the reduced Hospital ID3 services will then be moved to Hospital ID2
 - Outpatient utilization will increase by 15%
 - Hospital ID1 and ID3 costs/admission will not change
 - Hospital ID2 costs/admission will increase by 50%
 - Outpatient charges/services will go down by 25%
 - LBS will add an administrative charge of \$1.10 PMPM
- (a) (2 points) Discuss differences between BH/CD and radiology services in how access to care is obtained and utilization is controlled in a managed care environment.
- (b) (2 points) Describe mechanisms The Bedford Group can use to reduce provider reimbursement costs for BH/CD and for radiology services.

15. Continued

- (c) *(2 points)* Outline issues you would consider in determining whether carve-out is preferable to carve-in strategies for both BH/CD and for radiology services.
- (d) *(1 point)* Calculate the capitation rate for physician radiology services for the year 2001 using the case study data and assuming the VP of Provider Contracts' prediction is correct. Show your work.
- (e) *(7 points)* Calculate the capitation LBS would have charged in 2000 based on The Bedford Group's actual utilization experience. Determine the financial impact to The Bedford Group in 2000 if LBS' assumptions had been true. Show your work.

Questions 14 through 16 pertain to the Case Study

- 16.** (4 points) As the Actuary for The Bedford Group, you have been discussing the hospital inpatient utilization with the Medical Director. The table below shows the unmanaged and optimal utilization levels reflecting The Bedford Group's demographic mix and geographic location.

Assume the table below applies for both 2000 and 2001.

	Admits /1,000	Days /1,000
Unmanaged	75	345
Optimally Managed	55	180

- (a) Calculate the actual 2000 and budgeted 2001 degree of healthcare management for The Bedford Group using data from Table MC-4. Outline factors to consider when evaluating the hospital utilization and cost data. Show your work.
- (b) Outline a report to the Medical Director that describes medical management approaches that may be used to meet budgeted utilization for 2001.

17. (4 points) You are a consulting actuary for an HMO evaluating a prescription drug benefit program for its health plans. You will be making a presentation to the Board and will need to include the following:

- (a) Describe the three general categories of prescription drugs as distinguished by manufacturers' patents.
- (b) Outline plan features used to control prescription drug average charges and utilization.
- (c) Describe functions performed by a Pharmacy Benefit Manager (PBM) and how a PBM can manage drug costs.

18. (7 points) You are the financial actuary for PDQ HMO and have been asked by your CFO to develop an operating statement forecast for 2002. PDQ sells exclusively commercial group business. PDQ is considering the financial impact of several changes which are targeted to occur on July 1, 2002.

- (a) Describe the components of an operating statement. Discuss assumptions needed for forecasting an operating statement for PDQ.
- (b) The claim administration system will become more automated to increase efficiency. Describe the impact of this change on your forecast assumptions.
- (c) PDQ has a staff model HMO subsidiary, DOX. Market pressures may force DOX to move to an IPA model. Describe how this change might impact your forecast assumptions for DOX.
- (d) Your Medical Director will implement stricter utilization management controls and initiate a Disease Management (DM) program. To accomplish this, she will be contracting with an outside vendor for disease management services. Describe the impact of these initiatives on your forecast assumptions. Discuss how your assumptions would differ if the DM program were developed in-house.
- (e) The jurisdiction in which PDQ is domiciled is implementing a premium tax, a high risk pool charge, and mandated benefits covering services previously excluded from your policies. Describe how these reforms will impact your forecast assumptions.

****END OF EXAMINATION****