****BEGINNING OF EXAMINATION****
HEALTH, GROUP LIFE & MANAGED CARE
MORNING SESSION

1. *(3 points)*

(a) Explain non-financial uses of reinsurance.

(b) Describe limitations of reinsurance.

2. *(3 points)* You are the actuary for a US health insurance company. You have been asked to make a presentation to your Board of Directors regarding the regulatory environment for your company.

(a) Describe goals and objectives of insurance regulation.

(b) Describe the legal framework for insurance regulation and means of enforcement.

3. *(7 points)* You are a consulting actuary retained by an employer group. Following the presentation of renewal rates to the group, you have been asked to attend a meeting to review trend calculations.

You are given the following information:

- Allowed trend: 15%
- Incurred claims: $5,250,000
- Average monthly membership of the group: 2,000 members
- The current plan is Plan A, but the group is considering Plan B:

	Plan A	Plan B
Deductible	$250	$1,500
Coinsurance	20%	30%
Value of the member cost sharing (PMPM)	$50	$100

- Assume the value of the deductible does not vary from year to year.

(a) Describe in detail external sources of trend that you think might be helpful in your trend discussion.

(b) Describe common problems in computing trends that you might need to investigate.

(c) Calculate the net trend for the two plans and explain why there might be a difference. Show your work.

(d) Describe major issues which might need to be addressed if Plans A and B were to both be offered as a dual option.

Questions 4-7 pertain to the Case Study

4. *(7 points)* You are the actuary at Wonderful Life and have received a request for proposal from JLB Company (JLB) for a multi-option health quote effective January 1, 2005. JLB currently offers only a $100 deductible indemnity plan.

Using data found in Tables MM-2a and MM-2b and the following additional information:

- Total claims incurred for July 1, 2003 to June 30, 2004 were $4,063,000.
- Claim amounts in excess of $50,000 were $278,000.
- Average employee enrollment during this period was 500 single and 750 family contracts.
- Wonderful Life's PPO network discount is 30%.
- In-network utilization is 85%.
- Use of the network reduces utilization by 5% as compared to indemnity.

(a) Discuss pricing considerations in a multi-option environment.

(b) Calculate 2-tier gross premium rates for a $100 deductible indemnity option, and a $500 deductible PPO option, assuming no selection impact. Show your work.

(c) Outline considerations if JLB's current plan was a managed care plan instead of an indemnity plan.

Questions 4-7 pertain to the Case Study

5. *(9 points)* Wonderful Life's management is evaluating the company's profit and surplus requirements. You are given the data in Table C-1 and the assumption that Risk-Based Capital (RBC) is 18% of premium.

(a) *(1 point)* Discuss methods of measuring profit.

(b) *(2 points)* Discuss distortions that may require adjustment to avoid misrepresentation of profits.

(c) *(3 points)* Describe implications of the following when modeling required surplus for Wonderful Life:

i. Reinsurance strategy
ii. Dividend philosophy
iii. Expense management controls
iv. Premium growth

(d) *(3 points)* Determine if Wonderful Life achieved the targeted 12.5% return on equity for 2004. Show your work.

Questions 4-7 pertain to the Case Study

6. *(9 points)* You are the group pricing actuary for Wonderful Life Insurance Company. You are preparing a proposal for Bailey Industries which includes an analysis of prior experience. You are given the data in Table BI-1b and the following assumptions:

- The only items causing differences in claims costs are plan design and utilization differences caused by plan design.
- The average members per contract for both the PPO and HMO plans is 2.2.
- Member Cost as a percentage of claims is as follows:

		Utilization Adjustment Range		Member Cost Sharing Range	
Service Type	% of Cost	Low	High	Low	High
Facility	50.0%	0.0%	5.0%	0.0%	25.0%
Professional	30.0%	-5.0%	20.0%	0.0%	40.0%
Pharmacy	20.0%	0.0%	20.0%	0.0%	25.0%
Total	100.0%				

Average Member Cost Sharing

Service Type	PPO	HMO
Facility	17.5%	0.0%
Professional	25.0%	5.0%
Pharmacy	18.0%	18.0%

(a) *(3 points)* Describe the criteria that Wonderful Life would use to underwrite Bailey Industries.

(b) *(2 points)* Describe the models you might use to predict selection in a multi-option environment.

(c) *(4 points)* Calculate the expected change in utilization for the HMO plan using the member utilization cost model. Show your work.

Questions 4-7 pertain to the Case Study

7. *(7 points)* You are an actuary at Wonderful Life and have been asked to discuss sources of profit using Group 1 data as an example.

In addition to the data in Tables MM-1, MM-2a, MM-2b, and MM-3a, assume:

- Single/Family manual rates for 2005 are the result of trending historical manual rates.
- Expenses, taxes, and investment income are expressed as the percentages from Table MM-1 for 2004.

(a) Discuss major factors affecting financial results for the group line of business.

(b) Outline the various sources of profit for group insurance.

(c) Calculate profits by source for Group 1 for the experience period. Show your work.

8. *(7 points)* You are the consulting actuary for ACME, Inc. They are interested in offering a Patient Directed Healthcare Benefit (PDHB) plan with the following structure:

<u>Option 1</u>

- Multi-plan option plus Flexible Spending Account (FSA),
- Employer provides core contribution, offers multiple health plan choices, and sets menu.

<u>Option 2</u>

- High Deductible Plan plus FSA plus Personal Health Account (PHA),
- Employer provides core contribution, access to multiple high deductible plans, and segregated PHA's.

(a) Describe factors that are making consumerism a significant trend.

(b) Compare and contrast the key dimensions of PDHB's as they relate to the two options ACME is considering.

(c) Describe the healthcare challenges that can be addressed by PDHB's with respect to:

i. Employees
ii. Employers

9. *(5 points)* You are the pricing actuary for Enamel Insurance Company (EIC). EIC is interested in adding a dental product to its portfolio and has asked you to prepare a report to senior management.

(a) Describe ways to control dental claims costs.

(b) Describe the underwriting and rating parameters used for dental insurance.

10. *(3 points)* You are the Valuation Actuary for Belt and Suspenders Health Insurance Company. Your company offers a variety of health products that may require a variety of methods for determining claim liabilities.

(a) Describe considerations which might influence the level of conservatism targeted for a given block of business.

(b) Describe approaches to introducing conservatism into each of the common methods used to compute claim liabilities.

****BEGINNING OF EXAMINATION****
HEALTH AND GROUP LIFE SEGMENT
Beginning with Question 11

11. *(4 points)* Regarding claims practices for short term disability (STD) coverages:

(a) Describe the tools available to challenge questionable STD claims.

(b) Discuss methods, including the pros and cons for measuring overall STD claims levels.

(c) Describe the sources of information available to a claims examiner regarding STD claims.

12. *(4 points)* You are an actuary responsible for developing your company's financial forecast models. Recently your company has improved access and quality of data. The Chief Actuary is now encouraging you to incorporate additional situations in forecast modeling.

(a) *(3 points)* Discuss basic principles for designing forecast models.

(b) *(1 point)* Outline ways in which forecast modeling can influence company actions to help achieve business objectives.

13. *(8 points)* You are the chief actuary for ABC Insurance Company. You are considering purchasing an individual insurance block of business but are concerned about ABC's ability to administer such business.

(a) Discuss the steps an agent goes through in selling and servicing individual health insurance policies.

(b) Describe considerations in plan design, pricing, and distribution channels.

(c) Describe the typical underwriting considerations for individual health insurance.

(d) Describe elements included in rating classification systems.

(e) Explain types of premium guarantees that could be offered.

14. *(4 points)* You are the valuation actuary for TAT Health Insurance Company. You are concerned about the increase in turn around time for claim payment and have been working with the manager of the claims area to address this concern.

(a) Describe the basic purposes of claims and benefits administration.

(b) Discuss the common problems seen in claims and benefits administration and their ramifications.

(c) Outline the basic principles of inventory management and mechanisms for inventory control.

Question 15 pertains to the Case Study

15. *(5 points)* A benefits consultant has approached Wonderful Life about insuring her client's employer-sponsored Group Long Term Disability (GLTD) coverage. The GLTD coverage has a 180-day elimination period. There are 1,100 employees eligible for GLTD coverage with the following age distribution:

Age	Employees
18-24	400
25-29	300
30-34	200
35-39	-
40-44	100
45-49	-
50-54	100
55-59	-
60-64	-
Total	1,100

You estimate that the group's incidence rate will be 150% of the male incidence rates found in Table GLD-6A. The group has supplied prior experience based on 5,000 life years that produces an aggregate experience claim rate of $0.98 per $100 of monthly benefit.

Wonderful Life's profit requirement on GLTD business is 5.0% of premium. Total expense will follow Wonderful Life's actual financials for the most recent year as found in Table GLD-3A.

(a) Calculate the group's composite manual monthly gross premium rate per $100 of monthly benefit, assuming an average reserve of $54 per open claim per $1 of benefit. Show your work.

(b) Calculate the blended monthly gross premium rate using a credibility formula of N/(N+5,000). Show your work.

(c) Discuss the different types of reserves that Wonderful Life will hold for this coverage, and how they are determined.

16. *(8 points)* You are a group benefits consultant at NOVA Design Inc. One of your Canadian clients has the following group benefits plan:

Benefits	**Coverage**	**Monthly premium rates**	**Volume**
Life insurance	3 × salary	\$0.32 per \$1,000 benefit	\$46,200,000
Long–term disability	75% of monthly salary	\$1.05 per \$100 benefit	\$962,500
Medical	No deductible 100% coinsurance for all services	Single: \$ 50 Family: \$125	Single: 120 Family: 280
Dental	No deductible 90% coinsurance for all services	Single: \$30 Family: \$75	Single: 120 Family: 280

The employer pays 100% of the cost for all benefits.

Your client wants to review its plan design and introduce a Health Care Expense Account (HCEA). The new plan design has to be cost neutral in the first year. Your client expects, however, to save some cost over time through maintaining a fixed HCEA credit formula. You are proposing the following design:

Benefits	**Coverage**
Life insurance	1 × salary
Long –term disability	66.7% of monthly salary
Medical	No deductible 80% coinsurance for all services
Dental	No coverage
HCEA	Offered

(a) *(1 point)* Describe the advantages of an HCEA.

(b) *(2 points)* Describe how the HCEA can be funded and the decisions your client must make in setting it up.

(c) *(3 points)* Calculate the money available to fund the HCEA pool, develop a credit formula to allocate credits to employees, and explain the pros and cons of your formula. Show your work.

(d) *(2 points)* Calculate aggregate savings for your client's next renewal, assuming medical and dental inflation of 15% and 7.5% respectively, and an average increase in salaries of 3%. Show your work.

17. *(3 points)* You are the chief group underwriter at a major insurance company in the U.S. A number of your underwriters will be retiring shortly, and you must train junior staff to fill these positions. Your group line of business products include life insurance, long-term disability, and long-term care. Outline underwriting considerations for each of these products.

18. *(6 points)* You are a valuation actuary for The World's Best Insurance Company. You have been asked to estimate expected claim costs for non-institutional long-term care (LTC) benefits for a 62-year old male. You have the following information for your company's LTC product:

Benefit Amount:	$100/day
Benefit Trigger:	2 Activities of Daily Living (ADL) or Cognitive Impairment (CI)
Benefit Period:	24 months
Elimination Period:	6 months

Lapse rate information:

Duration	Lapse Rate	Anti-selective lapse factor
0	6%	0.8
1	5%	0.7
2	4%	0.6
3	3%	0.5
4	2%	0.4

You are also given the following information specific to a 62-year old male:

Annual Incidence per $1,000:	10.15
Non-Institutional Disability Day Average:	882

Published industry experience tabular data on the distribution of non-institutional claim durations for males age 62:

Non-institutional Disability Days by Duration from Incurral and ADL/CI Status Age 62 Male								
Percentage of Non-institutional Days Beyond Duration								
	No CI				With CI			
Duration in months	0 ADL	1 ADL	2 ADL	3+ ADL	0 ADL	1 ADL	2 ADL	3+ ADL
0	n/a	40.88	10.85	11.85	31.49	2.34	1.28	1.65
6	n/a	31.90	8.96	9.70	30.67	2.15	1.18	1.52
24	n/a	14.28	4.73	4.78	28.06	1.65	0.91	1.13
30	n/a	10.82	3.78	3.79	27.19	1.51	0.84	1.02

(a) *(3 points)* Calculate the estimated non-institutional claim cost per month. Show your work.

(b) *(2 points)* Discuss how voluntary lapse rates are used in individual LTC valuation methods, and how they relate to anti-selection.

(c) *(1 point)* Calculate the morbidity load at duration 4. Show your work.

19. *(6 points)* You are the consultant for BigFish Inc., who recently acquired LittleFish Inc. BigFish Inc. has a flexible benefits plan, while LittleFish Inc. has a traditional plan. BigFish and LittleFish operate in separate markets. Nemo, the President of BigFish Inc. has asked you to prepare a report on transitioning LittleFish's plan to BigFish's plan.

Current pricing information is shown in the table below:

BigFish Inc. Plan Information:

	Price Tags				Relative Value	
	Medical		Dental			
Plan Option	Single	Family	Single	Family	Medical	Dental
A	$100	$250	$105	$280	60%	80%
B	$200	$500	$150	$400	100%	100%
C	$350	$875	$225	$600	150%	125%

- Credits: $350 for Single Coverage
  $900 for Family Coverage

LittleFish Inc. Plan Information:

	Medical		Dental	
	Single	Family	Single	Family
Current Costs	$225	$550	$140	$420

Expected Participation in Little Fish Flex Plan

	Medical		Dental	
Plan Option	Single	Family	Single	Family
A	5%	10%	10%	5%
B	25%	30%	25%	40%
C	10%	20%	5%	15%

- The current medical plan is 20% richer than the BigFish medical flex plan Option B.
- The current dental plan is 10% less rich than the BigFish dental flex plan Option B.
- LittleFish pays 100% of the costs.
- The enrollment is 40% Single and 60% Family

(a) *(4 points)* Calculate the impact to BigFish's cost of moving LittleFish into BigFish's flex plan, without change. Show your work.

(b) *(2 points)* Discuss why BigFish may want to maintain a separate benefits pricing structure from LittleFish, and the advantages and disadvantages of doing so.

20. *(3 points)* You are an actuarial consultant hired by XYZ Corporation to help them redesign their medical plan. XYZ Corporation is a manufacturing company that has 3,000 active employees and 500 retirees. All employees are located in a single metropolitan area. The Human Resources (HR) manager at XYZ Corporation has told you that she wants to redesign the medical plan options to encourage employee responsibility and consumerism.

(a) Describe factors which would make a patient directed healthcare benefit approach appropriate for XYZ.

(b) Outline next steps the HR manager could take to implement this type of plan.

21. *(5 points)* You have been asked to review the impact of changing the specific deductible for the aggregate stop loss arrangement of one of your client's self-funded plans.

You are given the following information for the most recent plan year:

Stop Loss Information	
Expected total losses (PEPM)	$400
Expected Monthly Employees	240
Aggregate Attachment Factor	120% of expected total losses
Minimum Attachment Point	90% of the expected annual attachment point
Actual Loss Information	
Employee Months	3,000
Total Losses	$1,635,000
Covered Losses Exceeding $100,000	
Person A	$300,000
Person B	$125,000
Person C	$250,000

You are considering two specific stop loss deductible scenarios:

i. $100,000 (current plan)
ii. $250,000 (alternative plan)

(a) Explain the process for setting the expected losses and aggregate attachment factor.

(b) Describe aggregate stop loss underwriting considerations from the insurer's point of view.

(c) Calculate the total stop loss reimbursement for the most recent plan year under each specific stop loss deductible scenario. Show your work.

22. *(4 points)* You are the pricing actuary of ONLY Life Insurance Company. The company is looking into entering the Individual DI market. The V.P. of Marketing has come to you with the following proposed plan:

• Target Market	Association of Physicians
• Underwriting	Non-Cancelable
• Definition of Disability	Pure Own Occupation
• Premium Rate Structure	Unisex, varying by age
• Monthly Benefit	Greater of: average monthly benefit over prior 12 months; or greatest average monthly earnings for any 2 successive years over the prior 5 years
• Inflation	COLA riders included with a minimum annual increase of 6% per year
• Maximum Benefit	Unlimited
• Elimination Period	1 month

(a) Discuss each element of the proposed plan design with respect to the company's exposure to risk and recommend changes to limit the company's risk.

(b) Discuss various factors that should be considered to ensure profitability of the product in today's environment in terms of pricing, underwriting, and management.