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

1. *(4 points)* You are the consulting actuary for PMI, Inc. and have been asked to perform an audit on their TPA. You have been given the following information:

Administrative fee (PEPM): $18.00

Contractual Quality Targets:	**Target %**	**% of Administrative Fee at risk**
Overall Accuracy	98.0%	5.0%
Payment Accuracy	99.0%	5.0%
Financial Accuracy	99.5%	5.0%

Experience for the contract period:

	Count	**Dollar**
Total claims paid	15,000	2,250,000
Claims with errors	50	
Clinical errors	75	
Overpayments	100	$10,000
Underpayments	125	$18,750

(a) Describe major issues to be addressed when auditing a TPA.

(b) Describe the quality targets used in this contract.

(c) Determine if the TPA met its targets and calculate the ultimate administrative fee for PMI. Show your work.

2. *(8 points)* You are an actuary for a U.S. small group insurance company and have been asked to be the product manager for a new hospital-surgical expense product sold to individuals.

(a) Describe the responsibilities of a product manager.

(b) Describe different product development processes you might pursue.

(c) Compare different distributions models available for group versus individual products.

(d) Describe the underwriting process from the initial types of underwriting to the potential final decisions.

(e) Describe regulatory constraints which would be applicable to this product.

Questions 3 – 6 pertain to the Case Study

3. *(6 points)* You are an actuary at Wonderful Life. Management is considering entering the association group market.

(a) Describe the types of association programs Wonderful Life could consider.

(b) Describe the characteristics of a successful association plan.

(c) Compare association plans to Taft-Hartley groups and purchasing alliances.

(d) Recommend whether association plans fit within Wonderful Life's current products and practices. Justify your response.

Questions 3 – 6 pertain to the Case Study

4. *(6 points)* You are a pricing actuary for Wonderful Life. The chief actuary, has asked you to investigate the purchase of a predictive model to help in measuring relative risk. You will use this model to estimate the accuracy of pricing in your book of business.

In addition to the data in Tables MM-2b and MM-3a, you are given the following:

	Risk Score
Group 1	1.07
Group 4	1.30

(a) Describe the steps of the health risk adjustment process.

(b) Describe risk assessment methods.

(c) Calculate adjusted claims experience for Groups 1 and 4 using:
  (i) Wonderful Life's current region and age/sex factors
  (ii) The above risk score outcomes

Show your work.

(d) Evaluate the results from (c) in terms of relative pricing accuracy. Justify your response.

5. *(8 points)* You are the VP of Small Group Underwriting for Wonderful Life and have been asked to review the underwriting procedures as a result of the deteriorating experience. You have also been asked to design a durational study for Wonderful Life's closed block of small group business to determine the impact of variation by duration on the experience.

Table MM-7 in the case study summarizes five years of experience for the closed block of Wonderful Life's small group business.

(a) *(2 points)* Describe the impact that passage of HIPAA may have had on the small group experience.

(b) *(2 points)* Describe considerations that should be included in the small group underwriting process.

(c) *(1 point)* List items you should consider when compiling data for a durational study.

(d) *(3 points)* Calculate the annual durational factors for Wonderful Life's closed block of small group experience using the data in table MM-7 and other relevant information. Show your work.

Questions 3 – 6 pertain to the Case Study

6. *(4 points)* On January 1, 2004 Wonderful Life entered a contractual agreement with an employer which includes setting up a risk sharing arrangement through a claims stabilization reserve (CSR). The employer is required to maintain a minimum CSR level equal to two months of premium after which any excess is refunded.

You are given the following:

- Incurred claims represent 10% of each monthly amount shown in Table MM – 6a
- Earned premiums for 2004 are $92,384,000
- Premiums are paid uniformly throughout the year
- Interest is credited on IBNR at an annual rate of 3%
- One half a year of interest is credited on the IBNR
- Risk and retention is 15.9% of premium

(a) *(1 point)* Describe the purpose of a CSR.

(b) *(3 points)* Calculate the CSR and refund, if any, on December 31, 2004. Show your work.

7. *(9 points)* Anderson Industries has purchased medical stop-loss insurance from OX Life with the following parameters:

- Coverage period: Calendar Year 2005 loss occurring basis with 3-month run-in and no run-out.
- Specific stop-loss:
  - Deductible - $250,000.
  - Coverage – 100% above deductible.
- Aggregate stop-loss:
  - Attachment point – 120% of expected claims.
  - Coverage – 100% above attachment point.

OX Life has purchased reinsurance from Retrocede, Inc. with the following parameters:

- Coverage period: Calendar Year 2005 risk attaching basis with no run-in or run-out.
- Specific:
  - Deductible - $300,000.
  - Coverage – 90% of claims above deductible to a cap of $500,000

You are given the following information:

- Expected 2005 claim per employee is $2,750
- Number of employees is 1,500
- Only three covered members exceeded the Stop Loss Attachment as shown below. Paid claims for all other employees total $4,500,000

Name	**Incurred in**	**Paid in**	**Paid claim**
John Smith	November, 2004	June, 2005	$175,000
	January, 2005	July, 2005	$195,000
	September, 2004	August, 2005	$105,000
Total			**$475,000**
Mary Thompson	October, 2004	March, 2005	$ 65,000
	January, 2005	February, 2005	$105,000
	March, 2005	September, 2005	$100,000
Total			**$270,000**
Annie Chan	June, 2004	January, 2005	$ 150,000
	December, 2004	March, 2005	$ 55,000
	February, 2005	March, 2005	$ 80,000
	August, 2005	December, 2005	$ 115,000
	April, 2005	May, 2005	$1,000,000
Total			**$1,400,000**

7. Continued

(a) *(2 points)* Describe ceding company considerations related to planning and managing reinsurance programs.

(b) *(5 points)* Calculate the amount of reinsurance payments from OX Life to Anderson Industries and from Retrocede to OX Life. Show your work.

(c) *(2 points*) Compare loss occurring versus risk attaching coverage periods for medical reinsurance versus stop-loss reinsurance.

8. *(4 points)* You are a pricing actuary for a company that sells group long-term disability insurance. You plan to implement a revision to the company's LTD base manual rates effective January 1, 2007, by steepening the age-sex slope. The aggregate effect of the rate adjustment on premiums is expected to be revenue neutral. The last rate change on the block was a 10% increase effective October 1, 2005.

The marketing department prepared the following exhibit to demonstrate their assertion that the proposed rates were inadvertently raised by 20%.

			Current		Proposed		
Case	**Case Type**	**Last Renewal**	**Premium**	**Lives**	**Premium**	**Lives**	**Change in Premium**
1	Renewal	3/1/05	$110,000	600	$121,000	588	10.0%
2	Renewal	3/1/05	$44,000	245	$51,000	260	15.9%
3	Renewal	3/1/04	$35,000	195	$42,000	220	20.0%
4	Renewal	5/1/05	$22,000	125	$27,500	142	25.0%
5	New	4/1/05	$17,500	90	$27,000	120	54.3%
6	Renewal	4/1/05	$34,000	180	$36,000	178	5.9%
7	New	4/1/05	$65,000	360	$84,500	360	30.0%
8	New	5/1/05	$150,000	800	$154,000	800	2.7%
9	Renewal	4/1/06	$40,000	220	$40,000	220	0.0%
10	New	4/1/05	$11,000	60	$15,000	86	36.4%
Total			$528,500	2,875	$598,000	2,974	20.0%

The actuarial student you assigned to review this information has agreed with their analysis. He recommends adjusting the rates to remove the inadvertent increase.

(a) Identify considerations when using past experience to project future results for rate filings.

(b) Evaluate the student's recommendation. Justify your position.

9. *(6 points)* You are the Chief Actuary for YRU Sick Health Insurance Company. You have been asked by the VP of Contracting, to help negotiate the reimbursement for the largest physician group in your network.

(a) Describe success factors needed for any provider reimbursement method.

(b) Describe traditional methods for provider reimbursement.

(c) Describe new methods of provider reimbursement that have been created as a result of changing laws, regulations, and marketplace conditions.

10. *(5 points)* The CEO of Cognitively Impaired Life has asked you to write a white paper on Long Term Care (LTC) insurance to assist in the Board's consideration of an expansion into this product.

(a) Describe the typical LTC coverage and plan features.

(b) Describe necessary pricing assumptions.

(c) Describe possible changes in consumer's behavior that may affect future LTC claims costs.

BEGINNING OF EXAMINATION
HEALTH AND GROUP LIFE SEGMENT
AFTERNOON SESSION

11. *(5 Points)* You are a Consulting Actuary for a large U.S. company that currently provides health coverage to only its active employees. Your client has requested information on the potential impact of FAS 106 liabilities on its financial reports if it were to begin to offer coverage to retirees as well.

(a) Describe the employer tax treatment for active employees and retirees for health coverage.

(b) Describe FAS 106, including a discussion of its scope, basic principles, and its required components.

12. *(5 points)* You are a consulting actuary to a fully insured U.S. employer with 1,000 employees. The CFO of the employer is looking to improve cash flow and has asked about alternative funding arrangements.

(a) Compare financial and legal features of fully-insured plans to self-insured plans.

(b) Describe other types of alternative funding arrangements.

(c) Outline considerations when changing funding mechanisms.

13. *(5 points)* The managed care division VP of your company has asked that you review trend analysis prepared by his staff.

(a) Describe the components and potential causes of trend.

(b) Describe approaches for performing base trend analysis.

(c) Describe macro-economic variables that may be considered in an econometric trend model.

14. *(5 points)* You are a consultant with ABC consulting services. Your client, Archaic Inc., wants to offer patient-directed healthcare benefits to its employees. Currently Archaic offers only one indemnity plan which reimburses all covered expenses at 90% after a $100 deductible. Each employee has a $500 out-of-pocket maximum.

(a) Describe different patient-directed healthcare approaches.

(b) List the key dimensions used to differentiate between approaches.

(c) Recommend a patient-directed healthcare approach for Archaic. Justify your choice.

Questions 15 and 16 pertain to the Case Study.

15. *(7 points)* You are the LTD underwriter at Wonderful Life. You just received a request for proposal from BIG Company. BIG offers LTD coverage to several classes of employees, including one class of executives with the following LTD benefits design:

	BIG Company Executives coverage
Benefit amount	75% of salary
Maximum benefit	$20,000
Elimination period	6 months
COLA	3% (starting 1 year after the date of disability)
Benefit duration	To age 65

BIG's active executive population covered for LTD is as follows:

	Male		**Female**	
Age	**Average salary**	**Number of employees**	**Average salary**	**Number of employees**
52	$275,000	6	$260,000	3
57	$300,000	2	$290,000	1
62	$350,000	1	$0	0

Currently, there is one disabled executive employee with the following information:

Claimant ID number	Date of Birth	Gender	Date of disability	Salary	Approved for Social Security benefits
0123	01-Jan-43	Male	01-Jan-05	$310,000	No

The average reserve factor is $53 per open claim per $1 of benefit.

Questions 15 and 16 pertain to the Case Study.

15. Continued

In view of the maximum benefit, Wonderful Life needs to obtain facultative reinsurance. Your reinsurer uses the same LTD incidence rates table for pricing as Wonderful Life, as shown in table GLD-6a.

(a) *(1 point)* Describe the primary forms of LTD reinsurance available in the market and the situations in which they are used.

(b) *(3 points)* Calculate the net annual reinsurance premium which would be applicable to BIG Company's executive class. Show your work.

(c) *(1 point)* Describe the disability claim process followed when evaluating a claim submission.

(d) *(2 points)* Calculate the total disability reserve for the current disabled claimant using table GLD-8a as at 31-Dec-05 and a valuation interest rate of 5%. Show your work.

Questions 15 and 16 pertain to the Case Study.

16. *(8 points)* You are the pricing actuary for Wonderful Life. You have been asked for a Life and LTD rate quote on a potential new employer group, which has had a Life and LTD plan in place for three years with the following plan design:

Benefit	Plan Design
Life:	1 times salary
LTD:	70% of salary, 6-month elimination period

You are given the following information in addition to tables GLD-2 and GLD-6a:

Employee Demographics of the group (assumed constant over three years):				
	Number of Employees		Average Salary	
Age	Male	Female	Male	Female
27	300	200	$50,000	$40,000
42	500	300	$80,000	$65,000
57	200	100	$120,000	$90,000

Claims Experience of the Group		
	Paid claims	
	Life	LTD
Year 1	$280,000	$70,000
Year 2	$0	$235,000
Year 3	$540,000	$350,000
Current LTD reserves: $4,500,000		
Experience is considered 40% credible for both Life and LTD		
Valuation rate is 7% per annum		

LTD Reserve Factors per Open Claim per $1 of Benefit		
Age	Male	Female
27	$50	$54
42	$60	$56
57	$48	$42

Questions 15 and 16 pertain to the Case Study.

16. Continued

(a) *(6 points)* Calculate the monthly case claim rate for Life and LTD. Show your work.

(b) *(2 points)* Describe additional information and adjustments that should be considered in determining the gross premium rates for this group.

17. *(4 points)* You are consulting to a U.S. employer who is in negotiations with their union group. The union has expressed interest in adding the following benefits:

- vision & hearing
- group legal
- group property & casualty insurance
- hospital indemnity
- specified illness

For each benefit describe:
(i) Typical benefit designs,
(ii) Pricing issues, and
(iii) Employer/employee cost-sharing arrangements.

18. *(4 points)* Company ABC offers employees a severance pay benefit for involuntary terminations. The plan provides a benefit equal to three months of pay for all management employees. Only one person has been eligible to receive a benefit in the last five years. You have just been hired to advise ABC on the proper accounting methodology, and to calculate the FAS 112 expense and obligation for this plan. You are provided the following additional information:

Benefit obligation at 1-Jan-05 = $0.00

	Number of Employees	Termination Date	Annual Pay at Termination
Group 1	10	31-Dec-05	$75,000
Group 2	6	30-Nov-05	$90,000
Group 3	3	31-Oct-05	$210,000

(a) Describe the different accounting methods for severance pay benefits.

(b) Determine the appropriate accounting method for ABC's plan, including the treatment of experience gains and losses.

(c) Calculate the 2005 FAS 112 expense as of 31-Dec-05 assuming a 0% discount rate. Show your work.

19. *(4 points)* You are the new group benefits consultant for a company with 400 employees. You have been asked to review the cafeteria-type flexible benefits plan design, with the following vision care benefits:

Vision Care	**Option 1**	**Option 2**	**Option 3**	**Option 4**	**Option 5**
Eye exams - maximum per 24 months	\$20	\$40	\$50	\$75	\$90
Lenses and frames - maximum per 24 months	Not covered	\$150	\$300	\$450	\$600

- Plan members re-enroll every January 1st.
- Employees can choose any option at the time of re-enrollment and also when a life-event occurs between re-enrollment periods.

(a) *(1 point)* Describe the concept of adverse selection.

(b) *(3 points)* Describe various design approaches to limit adverse selection and provide your recommendations to modify this plan.

20. *(3 points)* You are the product development actuary at TLC insurer and have been asked to investigate the possibility of offering a Long Term Care product.

(a) Describe sources of morbidity experience available to price LTC, and the advantages and disadvantages of each source of data.

(b) Describe factors that you should consider to determine your LTC morbidity assumption.

21. *(6 points)* As the benefits consultant for DEF, you have the following 2005 calendar year information available for the company's medical and dental care flexible benefits plan:

	2005 Price Tags (realistic)			
	Medical		Dental	
Plan Option	Single	Family	Single	Family
A	$100	$250	$100	$250
B	$300	$750	$200	$500
C	$600	$1,500	$400	$1,000

	2005 Annual Costs			
	Medical		Dental	
Plan Option	Single	Family	Single	Family
A	$6,000	$35,000	$10,000	$70,000
B	$65,000	$550,000	$50,000	$350,000
C	$75,000	$425,000	$40,000	$375,000

	Number of Employees in Flex Plan			
	Medical		Dental	
Plan Option	Single	Family	Single	Family
A	50	150	125	300
B	250	800	200	500
C	100	250	75	400

	Expected Annual Inflation	
Plan Option	Medical	Dental
A	5%	4%
B	8%	5%
C	12%	6%

21. (Continued)

You are given the following additional information:

- Credits for 2005: $850 Single/$2,000 Family
- Medical option B benefits will be enhanced for 2007 by an expected 6%, and option C by 10%, with no change to option A.
- Dental option B benefits will be reduced for 2007 by an expected 3%, and option C by 5%, with no change to option A.
- Price tags are set realistically to reflect the value of the coverage.
- Credits are increased each year based on the weighted average expected inflation for plan option B.
- DEF is considering changing the price/credit structure to an opt-up-or-opt-down scheme.

(a) Calculate the 2007 expected company cost for the medical and dental care flex plan, and the change relative to the 2005 cost. Show your work.

(b) Calculate the revised 2007 price tags and credits using the opt-up-or-opt down scheme, and discuss the potential drawbacks of this approach. Show your work.

22. *(4 points)* You are the product development actuary for a small specialty product insurance company. The company plans to expand its business by venturing into direct marketing of credit insurance products. You have developed the following assumptions:

Present value of future premium	$300,000
Present value of future claims and expenses	$210,000

(a) Calculate the maximum marketing cost which would generate a profit margin of 12%. Show your work.

(b) Describe potential actions the company may take to increase the profit margin.

(c) Describe various measures that can be used to estimate the profitability of the marketing campaign, and considerations in choosing the most appropriate measures.