1. (5 points) You are the COO of ABC Insurance Company. You are considering outsourcing the claim and benefit administration function.

(a) Describe common claims and benefit administration problems and their effects.

(b) Describe measures of claim quality and methods to increase quality.

(c) Describe methods commonly used to control claims costs and claims administrative expense.

(d) Review circumstances under which you might outsource claims administration.
2. (5 points) A company has successfully implemented a flexible benefits program for its salaried employees with the following benefits:

Basic Coverage

- Non-hospital and drug: $300 deductible, 75% coinsurance
- Hospital: Semi-private room, $150 maximum per day
- Out-of-country: $50,000 maximum per year
- Vision: No coverage
- $500,000 lifetime maximum

Enhanced Coverage

- Non-hospital and drug: $100 deductible, 90% coinsurance
- Hospital: Semi-private room, $250 maximum per day
- Out-of-country: $80,000 maximum per year
- Vision: $200 maximum per year
- $1,000,000 lifetime maximum

Employee Palpatine incurred the following medical expenses over a one-year period:

- Apr. 5 formulary drug prescription of $125
- Jun. 10 formulary drug prescription of $180
- Jul. 18 hospital stay, semi-private room at $180
- Jul. 19 hospital stay, semi-private room at $180
- Jul. 20 hospital stay, semi-private room at $180
- Sept. 22 formulary drug prescription of $60
- Dec. 5 new glasses at $280

(a) Identify and address the concerns the union might have with the company’s proposal to offer this program to union members. Include design alternatives that could be substituted.

(b) Explain the general principles regarding selection that should be considered when implementing a flexible benefits program.

(c) Calculate the out-of-pocket expenses Palpatine would have paid under the Basic and the Enhanced options.
Questions 3 – 8 pertain to the Case Study

3. (5 points) Wonderful Life’s small group block of business is experiencing deteriorating profits. The Chief Actuary believes part of this deterioration is due to the wearing off of underwriting. You have been asked to design a durational study for Wonderful Life’s closed block of small group business using the data found in Table MM-7.

(a) (1 point) Describe the information that would be required to compile this study.

(b) (1 point) Describe the potential limitations of the data used in a durational study and the factors you should consider in adjusting the data.

(c) (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 on the small group block discussed in the case study. Show your work.
Questions 3 – 8 pertain to the Case Study

4. (10 points) Wonderful Life is considering the purchase of medical reinsurance that is a combination of quota share and specific excess. The quote they have received is as follows:

**Specific excess**
- 100% of claims in excess of $50,000
- Covers claims incurred from July 1, 2000 through June 30, 2001
- Reinsurance premium = $20.00 Per Employee Per Month

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- 30% of claims incurred up to $50,000
- Ceding allowance: 20% of ceded premium
- Covers premium earned and claims incurred from July 1, 2000 through June 30, 2001

Wonderful Life’s management has set a pre-tax ROE target of 25% while holding risk-based capital at 30% of premium. Current operating expenses are 15.1% of premium and pre-tax investment income is 3.0% of premium.

(a) (4 points) Calculate Wonderful Life’s total pre-tax operating gain using the data in table MM-3 assuming Wonderful Life purchases this reinsurance coverage. Show your work.

(b) (4 points) Determine if Wonderful Life would have met its pre-tax ROE objectives:
   (i) Without the reinsurance coverage.
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(c) (2 points) Describe the other profit measures you could use in analyzing this business.
5. (7 points) You are the actuary for the Major Medical Division of Wonderful Life. You have been asked to develop a forecast for the major medical line.

You are given the data in Tables MM-3, MM-6, and MM-7.

(a) Describe the major projection elements governing the design of a financial forecast.

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6. (6 points) Wonderful Life is examining various methods of smoothing age-to-age development factors.

(a) (4 points) Calculate the first lag month’s development factor for Wonderful Life using the most recent four months of experience from Table MM-4b under the following averaging approaches:
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<td>Avg Cost</td>
</tr>
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<td>Sub-group 1</td>
<td>80%</td>
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(c) (2 points) The employer is currently paying 70% of the cost of Option 1 and Option 2.

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8. *(10 points)* You are an underwriter at Wonderful Life and have been given the following information:

- Tables BI with the following assumptions:
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(a) *(3 points)* Calculate the retrospective refunds for Group 4 and for Group 5. Show your work.

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(a) Describe general considerations related to this topic affecting all employers.

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**END OF EXAMINATION**
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10. (4 points) Senator Ima Crook from Anystate, USA has proposed a bill requiring Medicare to provide a prescription drug benefit.

This plan would be separate from medical benefits and would be the primary plan for purposes of coordination of benefits.

The plan would offer the following benefits:
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- Unlimited annual benefit.

ACME Widget Company currently pays the entire cost of a retiree prescription drug plan with the following copayments per prescription:
- $10 on generic drugs
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Jill Pill is a retiree of ACME anticipating the following monthly drug usage:

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<td>$100</td>
</tr>
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</table>

If this bill is adopted:

(a) Describe the different coordination of benefit (COB) approaches an employer could consider in relation to the new plan.

(b) For each COB approach, calculate the total annual cost to ACME in connection with Jill’s anticipated claims.
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   (a) Describe the type of expense allocations that could be used for individual health products.

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13. (5 points) You are a product development actuary working for a multi-line insurance company. The company is developing an individual medical insurance product.

(a) Outline the types of premium rate and renewal guarantees that may be used and characteristics of each.

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(d) Describe sources of information the underwriter might utilize.

14. (3 points) You are an actuary for JKL Life which has recently decided to enter the group medical line of business. You have been asked to lead a project to design the needed management information system.

(a) Review the challenges of producing management information reports.

(b) Describe information/reports that would be useful to analyze claims and expenses.
Questions 15 and 16 pertain to the Case Study

15. (5 points) The GLD Division of the Wonderful Life Insurance Company has been falling short of profit expectations on their group life business.

(a) Describe methods and considerations in the development of expected claims cost in the pricing of group life business.

(b) Recommend steps that Wonderful Life could take to lower their claim costs.

(c) Calculate the overall actual-to-expected ratio for Wonderful Life for 2001, using table GLD-2.
16. (8 points) The GLD Division of Wonderful Life markets both group and individual disability products. As the pricing actuary you have been asked to do a rate analysis for a new medical professional group LTD account. The group has requested a 90 day elimination period (ep) and 5 year maximum benefit period. It is believed that in order to win this account the rates should be no more than 5% higher than Wonderful Life’s current manual rates for groups of similar plan designs.

You are given the following information in addition to tables GLD-5, GLD-6, and GLD-8:

- Expenses and profits are 25% of premium.
- New account premium is based solely on manual rates.
- The group is assumed to be comprised entirely of 37 year old males.
- The interest rate is zero.
- Calculations should utilize annualized termination rates. Actual termination rates equal expected termination rates.
- 90-day ep termination rates are:
  - year 1: annualized termination rate for 37 year old males = 0.50.
  - subsequent years: 20% higher than the termination rates for 180 day ep.

(a) (6 points) Using Wonderful Life’s LTD 2000 incidence of claim experience, determine whether the marketing pricing expectations can be met:
(i) For the requested plan design
(ii) For a plan with a 180 day ep
Show your work.

(b) (2 points) Review other possible plan design features to be considered in meeting the marketing pricing expectation.
17. (4 points) You are the product development actuary for ABC Life. The new marketing VP has approached you about expanding the individual DI line of business with a product geared towards the upscale professional marketplace. He claims that in order to differentiate this product the most generous benefit package possible must be offered. He suggests you set the rates accordingly.

(a) Describe the potential benefits that can be offered to meet the VP’s request.

(b) Recommend which of the potential benefits should and should not be offered. Justify your recommendation.
18. (7 points) You have been hired as the consulting actuary for Company XYZ. Company XYZ implemented a flexible benefits plan four years ago, including broader choices for group life, LTD, medical, and dental benefits. Employees re-enroll for all benefits once a year. The life and LTD benefits each have one rate applicable to all employees, whereas the medical and dental benefits have different prices by option and family status. Company XYZ has observed higher than expected claims experience each year, and has noticed significant employee movement amongst the options from one year to the next.

You are given the following data for the most recent year.

<table>
<thead>
<tr>
<th>Option</th>
<th>Dental Enrollment</th>
<th>Actuarial Value</th>
<th>Price Tag</th>
<th>Actual Claims</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>100</td>
<td>$1000</td>
<td>$1300</td>
<td>$150,000</td>
</tr>
<tr>
<td>Intermediate</td>
<td>250</td>
<td>$800</td>
<td>$900</td>
<td>$220,000</td>
</tr>
<tr>
<td>Low</td>
<td>150</td>
<td>$500</td>
<td>$400</td>
<td>$45,000</td>
</tr>
<tr>
<td>Total</td>
<td>500</td>
<td></td>
<td></td>
<td>$415,000</td>
</tr>
</tbody>
</table>

(a) (2 points) Describe design approaches that could be used to reduce the chance of unfavorable experience.

(b) (1 point) Explain the advantages and disadvantages of maintaining a single rate for the life and LTD benefits.

(c) (3 points) Assuming no change in the dental coverage offered and a 5% trend rate for the coming year:
    (i) Propose potential pricing strategies, and
    (ii) Calculate the resulting prices for the upcoming year.

(d) (1 point) Describe methods that XYZ may use to better estimate employee participation for next year.
19. (4 points) Your Uncle Henry is shopping for an LTC policy for himself and his spouse. Henry works for a large employer that offers group LTC coverage as part of its employee benefit package.

(a) Compare and contrast the benefit features and underwriting requirements between individual and group LTC coversages.

(b) Describe various ways that insurers determine eligibility for LTC benefit payments.

(c) Explain differences in continuity of coverage provisions between group and individual LTC policies.

20. (5 points) The Worksite Marketing area of your company is exploring the idea of offering a range of supplemental accident and health (A&H) products to associations of professionals. The proposal is to distribute the following A&H products through direct marketing methods:

- Cancer
- Hospital Indemnity Plan (HIP)
- Disability Income
- Critical Illness

(a) Describe underwriting guidelines and direct marketing approaches appropriate to this target market.

(b) For each of the proposed products:
   (i) Describe common product features
   (ii) Evaluate their appropriateness for the direct marketing initiative. Support your evaluation.
21. (3 points) You are a consulting actuary working in the Medicare supplement market. You have been asked by a state regulator to provide insight into Medicare supplement pricing. The state regulation allows only the NAIC model benefits, no underwriting, and insurers can only use community rating. Pre-existing conditions may be excluded for up to 6 months.

The following is an example of some of the monthly premium rates in one of the major markets in the state.

<table>
<thead>
<tr>
<th>Model Plan B</th>
<th>Model Plan H</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insurer A</td>
<td>$109.86</td>
</tr>
<tr>
<td>Insurer B</td>
<td>$114.75</td>
</tr>
<tr>
<td>HMO A</td>
<td>$118.72</td>
</tr>
<tr>
<td>Medicare Select Product</td>
<td>$84.80</td>
</tr>
</tbody>
</table>

Explain what would cause different insurers to charge materially different rates for the above products.

22. (4 points) Company ABC is planning to implement a flexible benefits plan. The draft plan design includes life, LTD, medical and dental benefits, as well as a health care expense account. The medical and dental benefits include a core level of coverage plus two options, where the first option represents current coverage, and the second option provides enhanced benefits.

The current plan includes realistic prices for all benefits. Some of company ABC’s competitors who offer a flexible benefits program include “time off with pay”.

(a) Describe alternative pricing schemes for the proposed flexible benefits plan, including advantages and disadvantages of each.

(b) Describe the advantages of including time off with pay within the flexible benefit plan and outline the plan design considerations.

**END OF EXAMINATION**

AFTERNOON SESSION
1. (5 points) You are the COO of ABC Insurance Company. You are considering outsourcing the claim and benefit administration function.

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Employee Palpatine incurred the following medical expenses over a one-year period:

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(a) Review the challenges of producing management information reports.

(b) Describe information/reports that would be useful to analyze claims and expenses.
Questions 15 – 17 pertain to the Case Study

15. (6 points) You are an actuary for the Bedford Group. In a meeting with the VP of Provider Contracts, you are told that IPA1 and IPA3 are considering consolidating operations and would like to meet next week to formulate a new contract.

Your CEO is concerned that this consolidation would impact physician contracts. She wants to hold physician costs for all IPA’s prior to any risk-share arrangements to 125% of 2000 Medicare RBRVS.

Using Tables MC-5 and MC-7:

(a) Review the advantages and disadvantages of different contracting arrangements between physician entities and managed care companies.

(b) Describe the legal structure of an IPA and explain why IPA1 and IPA3 may or may not want to consolidate.

(c) Calculate the overall percentage of 2000 Medicare RBRVS paid in 2001. Show your work.

(d) Calculate the percentage of 2000 Medicare RBRVS that must be negotiated with the consolidated IPA in order to meet the CEO’s requirements. Show your work.
Questions 15 – 17 pertain to the Case Study

16. (4 points) You are an actuary for the Bedford Group. Hospital ID 1 has been successful with its Maternity case rate and would like to consider moving to a case rate or capitation reimbursement for its Medical and Surgical services.

Using Tables MC-2 and MC-7:

(a) Explain differences between case rate, capitation and per diem reimbursement arrangements and provide reasons why Hospital ID 1 may want to consider changing.

(b) Calculate a combined case rate for all Medical and Surgical inpatient services for Hospital ID 1 using 2001 experience. Show your work.

(c) Describe the financial issues that Hospital ID 1 should consider prior to revising its current contract.
Questions 15 – 17 pertain to the Case Study

17.  (12 points) You are the Chief Actuary for the Bedford Group and have been approached by a vendor offering demand management programs. You have determined that these programs can save 5% per year on Hospital ID 1 inpatient medical and surgical claims at a cost of $150,000 per year in administrative expenses.

In recent years Hospital ID 1 has been approaching full capacity of its inpatient beds. They are considering implementing a clinical pathways program. The hospital estimates that by implementing the program, it can reduce its medical and surgical inpatient days by 10%. Implementation cost for the program is estimated to be $250,000. Hospital ID 1 has approached you to share in half the implementation cost and to increase their reimbursement by 5% to recognize the improvement in care.

In addition to inpatient claims, the Bedford Group paid $57,960,000 in outpatient claims to Hospital ID 1 in 2001. Assume no other contract provisions change and membership and utilization remain at 2001 levels.

Using Tables MC-2, MC-3, MC-7, and MC-8:

(a)  (2 points) Compare and contrast disease management and demand management.

(b)  (2 points) Describe clinical pathways and their possible uses.

(c)  (6 points) Calculate the expected impact on 2001 revenue to Hospital ID 1 from the Bedford Group for the following programs:
   (i)  clinical pathways
   (ii) demand management

(d)  (2 points) Due to limited resources, only one of the two programs may be implemented. Recommend which program you would choose. Support your recommendation and show any related work.
18. (5 points) You are an actuary assigned to develop a cost estimate for Medicare to provide a prescription drug benefit to Medicare beneficiaries.

You are given the following data and information:
- benefit effective date is 1/1/2003
- all seniors will be covered and any existing drug coverages will be terminated
- annual deductible will be $3,000
- no coinsurance will be charged
- prescription drug per capita spending increases 14.5% per year
- prescription drug spending is uniform within each expenditure range

<table>
<thead>
<tr>
<th>Expenditure Range ($)</th>
<th>Expenditure Data for Calendar Year 2000 (amounts in millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Seniors with Drug coverage</td>
</tr>
<tr>
<td></td>
<td>Number of Seniors</td>
</tr>
<tr>
<td></td>
<td>Carrier</td>
</tr>
<tr>
<td>No cost</td>
<td>3</td>
</tr>
<tr>
<td>$0-250</td>
<td>5</td>
</tr>
<tr>
<td>$251-2,000</td>
<td>11</td>
</tr>
<tr>
<td>$2,001-3,000</td>
<td>5</td>
</tr>
<tr>
<td>$3,000+</td>
<td>3</td>
</tr>
</tbody>
</table>

(a) Calculate the 2003 expected drug cost:
(i) in total,
(ii) for Medicare.

(b) Outline comments regarding the ability of the proposed plan to control current and future Medicare drug costs.
19. *(4 points)* The 2002 budget for HMO DEF calls for reduced primary care and specialty physician utilization. An effort is being made to identify the least efficient physicians, and subsequently to change physician behavior, terminate contracts, or redirect care as needed.

(a) Describe how you would identify costly practice patterns.

(b) List data sources you might access to support this effort.

(c) Explain how risk share arrangements may influence utilization.

(d) List factors other than utilization patterns that you should consider before requesting termination of a physician.

20. *(4 points)* You are a consulting actuary to an insurance company that is considering creating an HMO subsidiary.

(a) Describe managed care regulation governing insurance company operations that the company may encounter.

(b) Describe obligations to perform medical management activities and consequences of non-compliance with such obligations.
21. **(5 points)** You are the Valuation Actuary for an HMO. You are developing your 12/31/2001 reserves for a block of business acquired from another company on July 1, 2001. Your company is not responsible for runout on claims incurred prior to July 1, 2001. You use the authorization method for developing the hospital inpatient IBNR reserve component. Your company has the following reimbursement schedules through September 2001:

<table>
<thead>
<tr>
<th></th>
<th>Average Per Diem</th>
<th>Pct of Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital A</td>
<td>$1,000</td>
<td>25%</td>
</tr>
<tr>
<td>Hospital B</td>
<td>$1,100</td>
<td>50%</td>
</tr>
<tr>
<td>Hospital C</td>
<td>$1,200</td>
<td>25%</td>
</tr>
</tbody>
</table>

Effective October 1, 2001, Hospitals A and B increased their per diems by 10% and Hospital C increased its per diem by 20%. Your system reports have provided the following information for inpatient services:

<table>
<thead>
<tr>
<th></th>
<th>Authorized Hospital Days</th>
<th>Incurred and Paid Claims</th>
<th>Completion Factors</th>
<th>Authorization Credibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jul 2001</td>
<td>2,205</td>
<td>$2,475,000</td>
<td>1.00</td>
<td>0</td>
</tr>
<tr>
<td>Aug 2001</td>
<td>2,200</td>
<td>$1,950,000</td>
<td>.85</td>
<td>0</td>
</tr>
<tr>
<td>Sep 2001</td>
<td>2,225</td>
<td>$2,150,000</td>
<td>.80</td>
<td>.25</td>
</tr>
<tr>
<td>Oct 2001</td>
<td>2,050</td>
<td>$1,700,000</td>
<td>.60</td>
<td>.50</td>
</tr>
<tr>
<td>Nov 2001</td>
<td>2,025</td>
<td>$1,070,000</td>
<td>.35</td>
<td>.75</td>
</tr>
<tr>
<td>Dec 2001</td>
<td>1,950</td>
<td>$247,500</td>
<td>.10</td>
<td>1.00</td>
</tr>
</tbody>
</table>

(a) **(1 point)** Create a checklist of managed care issues that you will need to consider in preparing your annual Statement of Opinion.

(b) **(3 points)** Calculate the IBNR reserve as of 12/31/2001 based on the information provided. Show your work.

(c) **(1 point)** List reasons why the authorized hospital days may differ from the incurred days.

**END OF EXAMINATION**

**AFTERNOON SESSION**