INSTRUCTIONS TO CANDIDATES

General Instructions

1. This examination has a total of 100 points. It consists of a morning session (worth 60 points) and an afternoon session (worth 40 points).
   a) The morning session consists of 9 questions numbered 1 through 9.
   b) The afternoon session consists of 6 questions numbered 10 through 15.

   The points for each question are indicated at the beginning of the question. Questions 10-15 pertain to the Case Study.

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 morning or afternoon session for Exam GHADV.

6. Be sure your written-answer envelope is signed because if it is not, your examination will not be graded.

Recognized by the Canadian Institute of Actuaries.

Tournez le cahier d’examen pour la version française.
1. (5 points)

(a) (1 point) Describe the purpose and function of creating an Accountable Care Organization (ACO).

(b) (2 points)

(i) Describe areas of improvement targeted by ACOs.

(ii) Identify an example of an approach or intervention for each area.

You work for an ACO that has adopted a strategy to reduce costs due to heart surgery, including improving outcomes in the following categories:
- Follow-up physician visits
- Prescription drug utilization
- Hospital readmissions

You are given the following:
- Target Population is 10,000 members
- Cost Trend is 0%

<table>
<thead>
<tr>
<th></th>
<th>Reference Population</th>
<th>Target Population</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Utilization</td>
<td>Utilization</td>
</tr>
<tr>
<td></td>
<td>Baseline Period</td>
<td>Intervention Period</td>
</tr>
<tr>
<td>Follow-up physician visits per member per month</td>
<td>2.00</td>
<td>2.05</td>
</tr>
<tr>
<td>Prescriptions per member per month</td>
<td>0.95</td>
<td>1.00</td>
</tr>
<tr>
<td>Hospital Readmission per thousand per month</td>
<td>5.00</td>
<td>5.15</td>
</tr>
</tbody>
</table>

(c) (2 points) Calculate:

(i) Savings for each category

(ii) Overall program savings

Show your work.
2. (6 points) XYZ Company was recently divested from its larger parent company. As part of the divestiture, XYZ wants to explore transitioning from a self-insured funding arrangement for its medical coverage to a fully-insured funding arrangement.

(a) (2 points) Describe advantages and disadvantages of self-insured and fully-insured arrangements.

XYZ is considering two stop loss coverage options.

- Aggregate Stop Loss with a 125% threshold
- Specific Stop Loss

(b) (2 points) Sketch and describe graphs to illustrate how each option may limit the plan’s volatility.

You are given:

<table>
<thead>
<tr>
<th>Group</th>
<th>Risk Factor</th>
<th>Parent Company Covered Members</th>
<th>XYZ Covered Members</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>0.44</td>
<td>10,000</td>
<td>150</td>
</tr>
<tr>
<td>Medium</td>
<td>1.21</td>
<td>8,000</td>
<td>120</td>
</tr>
<tr>
<td>High</td>
<td>6.47</td>
<td>1,500</td>
<td>15</td>
</tr>
</tbody>
</table>

- XYZ does not have access to its own experience prior to its divestiture.

(c) (2 points)

(i) Calculate XYZ’s risk factor adjustment to apply to claims. Show your work.

(ii) Interpret the results for management.
3. (8 points)

(a) (1 point) List financial performance metrics for Pharmacy Benefit Managers (PBMs).

(b) (2 points) Compare and contrast a PBM’s role when providing prescription drug benefits:

(i) Through a health plan

(ii) Directly to plan sponsors (carved-out benefits)

Company DEF provides self-insured prescription drug coverage to its 1,000 employees. DEF is evaluating its prescription drug coverage.

You are given DEF’s prescription drug utilization data from last year:

<table>
<thead>
<tr>
<th></th>
<th>Scripts/1,000 members per year</th>
<th>Average Allowed Amount per script</th>
</tr>
</thead>
<tbody>
<tr>
<td>Generic - Retail</td>
<td>4,000</td>
<td>$30</td>
</tr>
<tr>
<td>Generic – Mail Order</td>
<td>200</td>
<td>$70</td>
</tr>
<tr>
<td>Brand – Retail – Formulary</td>
<td>400</td>
<td>$300</td>
</tr>
<tr>
<td>Brand – Retail – Non-Formulary</td>
<td>150</td>
<td>$430</td>
</tr>
<tr>
<td>Brand- Mail Order-Formulary</td>
<td>270</td>
<td>$750</td>
</tr>
<tr>
<td>Brand – Mail Order – Non-Formulary</td>
<td>300</td>
<td>$1,200</td>
</tr>
</tbody>
</table>
3. Continued

DEF plans to implement a new prescription drug management program that is expected to shift 5% of brand formulary drug utilization to generics. You are given:

- The program will cost $12,000 per year.
- DEF receives rebates equal to 10% of the allowed amount for formulary brand drugs.
- Utilization and unit cost trends are 0% annually.
- There will be no change in the covered membership.

(c) (4 points) Calculate the impact of the program on DEF’s prescription drug spending. Show your work.

(d) (1 point) Recommend whether or not DEF should implement the program. Justify your response.
4. (10 points)

(a) (2 points) State the basic formula and describe the variables for assigning credibility for group medical by size of group.

You are given:

- $K_1 = 0.25$
- $K_2 = K_3 = 0.01$

(b) (1 point) Calculate the credibility for the following group sizes:

- 10
- 100
- 1000

Show your work.

(c) (1 point) Describe the adjustments to the basic formula for turnover of employees.

(d) (1 point) Calculate the credibility for a 10 member group using the following values for $p$:

- 70%
- 80%
- 90%

Show your work.

(e) (1 point) Describe limits on individual claims amounts that may be utilized in assigning credibility.

(f) (1 point) Describe specific stop loss arrangements that may be utilized in assigning credibility.

(g) (1 point) State the basic formula for stop loss credibility

(h) (2 points) Describe the impact of utilizing different time periods for assigning credibility. Include applicable formulas.
5. (7 points)

(a) (1 point) Describe issues insurers need to consider when deciding to offer Level-Funded Products (LFPs).

You are the actuary for a small employer that is considering an LFP.

(b) (3 points) Create a chart that provides the following:

<table>
<thead>
<tr>
<th>Advantages of Self-Funding for the Employer</th>
<th>Applicability to LFP</th>
<th>Justification for Applicability</th>
</tr>
</thead>
<tbody>
<tr>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>Disadvantages of Self-Funding for the Employer</td>
<td>Applicability to LFP</td>
<td>Justification for Applicability</td>
</tr>
<tr>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
</tbody>
</table>

You are given:

<table>
<thead>
<tr>
<th>Specific Deductible</th>
<th>$20,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aggregate Stop Loss Corridor</td>
<td>125%</td>
</tr>
<tr>
<td>Expected Claim Cost Per Member Per Month (PMPM)</td>
<td>$192.65</td>
</tr>
<tr>
<td>Expected Reimbursement PMPM Under Specific Stop Loss (SSL)</td>
<td>$21.49</td>
</tr>
</tbody>
</table>

(c) (1 point) Calculate the maximum liability PMPM for the group. Show your work.

Assume the group’s specific stop loss experience occurs as expected.

(d) (1 point) Calculate the paid claims surplus PMPM for the group assuming:

(i) Total PMPM claim costs are 15% higher than expected

(ii) Total PMPM claim costs are 35% higher than expected

Show your work.

(e) (1 point) Recommend whether or not to purchase the LFP. Justify your answer.
6. (6 points)

(a) (1 point) List sources of change in chronic population risk-mix in Disease Management (DM) programs.

(b) (2 points) Describe how adjusting for changes in the population risk-mix can impact the evaluation of DM program savings.

You are given:

<table>
<thead>
<tr>
<th>Risk Status</th>
<th>Prevalence</th>
<th>Baseline Period Cost (Per Member Per Year)</th>
<th>Transition to High</th>
<th>Transition to Moderate</th>
<th>Transition to Low</th>
<th>Intervention Period Cost (Per Member Per Year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>10%</td>
<td>$35,000</td>
<td>30%</td>
<td>40%</td>
<td>30%</td>
<td>$40,000</td>
</tr>
<tr>
<td>Moderate</td>
<td>30%</td>
<td>$10,000</td>
<td>8%</td>
<td>40%</td>
<td>52%</td>
<td>$10,800</td>
</tr>
<tr>
<td>Low</td>
<td>60%</td>
<td>$5,000</td>
<td>6%</td>
<td>30%</td>
<td>64%</td>
<td>$5,350</td>
</tr>
</tbody>
</table>

- Annual cost trend: 11%.

(c) (3 points) Calculate the DM program savings. Show your work.
7. (9 points) You are the valuation actuary for a company that sells individual Long Term Care (LTC).

The CFO has decided to implement a 2 year preliminary term policy reserve on new LTC policies.

(a) (1 point) Explain:
   (i) when policy reserves are needed
   (ii) why a company would implement a preliminary term reserve

(b) (1 point) Explain the major differences between how statutory accounting and GAAP accounting reflect expenses in policy reserves.

You are given the following information:

<table>
<thead>
<tr>
<th>Year (t)</th>
<th>Persistency to Year (t)</th>
<th>Annual Claims</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1.0000</td>
<td>0.00</td>
</tr>
<tr>
<td>1</td>
<td>0.6498</td>
<td>92.28</td>
</tr>
<tr>
<td>2</td>
<td>0.4482</td>
<td>116.51</td>
</tr>
<tr>
<td>3</td>
<td>0.3316</td>
<td>136.70</td>
</tr>
</tbody>
</table>

- Interest rate = 0%
- Premiums are paid at the beginning of the year
- Claims are incurred at the end of the year

(c) (6 points)
   (i) Construct a chart of the reserve stream under prospective and retrospective reserve methods:

   • Per original policy
   • Per in force policy

   Show your work.

   (ii) Explain why the reserve streams differ.
7. Continued

The CFO is considering implementing a two-year preliminary term reserve on LTC products sold 5 years ago.

(d) *(I point)*

(i) Describe the minimum valuation standards for LTC preliminary term on a policy reserve.

(ii) Recommend an alternative to the CFO. Justify your response.
8. (4 points) You are an actuary working for XYZ Insurance Company. XYZ offers various products, such as small group ACA, small group transitional, and Level Funding.

(a) (1 point) Describe the need for health risk adjustment.

You are given the following about small groups A and B for 2017:

<table>
<thead>
<tr>
<th>Per Member Per Month (PMPM)</th>
<th>Company A</th>
<th>Company B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level Funding Premium</td>
<td>$ 291.33</td>
<td>$ 862.10</td>
</tr>
<tr>
<td>Small Group ACA Base Premium Rate</td>
<td>$ 386.54</td>
<td>$ 386.54</td>
</tr>
<tr>
<td>Small Group Transitional Base Net Premium Rate</td>
<td>$ 280.50</td>
<td>$ 280.50</td>
</tr>
<tr>
<td>Small Group Transitional Administrative Expenses</td>
<td>$ 60.12</td>
<td>$ 90.60</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Adjustment Factors</th>
<th>Company A</th>
<th>Company B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>0.96</td>
<td>1.65</td>
</tr>
<tr>
<td>Gender</td>
<td>0.86</td>
<td>1.15</td>
</tr>
<tr>
<td>Industry</td>
<td>0.90</td>
<td>1.10</td>
</tr>
<tr>
<td>Area</td>
<td>1.02</td>
<td>1.05</td>
</tr>
</tbody>
</table>

(b) (2 points) Calculate the premiums for each company for:

(i) Small group transitional

(ii) Small group ACA

Show your work.

Assume:

- The transitional period will expire in 2019.
- The 2017 premiums are the same in 2019.

(c) (1 point) Recommend which product XYZ should offer to each company. Justify your answer.
9.  

(5 points)

(a)  

(2 points) Describe types of care management programs and interventions.

(b)  

(1 point) Describe common features of care management programs.

You are given:

<table>
<thead>
<tr>
<th></th>
<th>Care Management Program 1</th>
<th>Care Management Program 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Health Plan Members</td>
<td>10,000</td>
<td>10,000</td>
</tr>
<tr>
<td>Number of Chronic Members</td>
<td>200</td>
<td>500</td>
</tr>
<tr>
<td>Annual Program Cost</td>
<td>$100,000</td>
<td>$300,000</td>
</tr>
<tr>
<td>Annual Gross Savings</td>
<td>$300,000</td>
<td>$700,000</td>
</tr>
</tbody>
</table>

(c)  

(2 points)

(i) Evaluate the economics of the two care management programs. Show your work.

(ii) Identify which program provides more economic value. Justify your answer.

**END OF EXAMINATION**

Morning Session
USE THIS PAGE FOR YOUR SCRATCH WORK