May, 2012

FELLOWSHIP EXAMINATION

FOUNDATIONS OF CASUALTY ACTUARIAL SCIENCE-II

Reg. No.

[Time : 3 Hours ]

Answer Any FIVE Questions only. 
Each Question carry 20 Marks.

[ Total Marks : 100 ]

Q.1. a) How Re-Insurance can be useful for an Insurance Company ?

b) How the Market Value of Fixed Income Investments is determined ?

Explain all the terms used in the formula.

c) Explain what is meant by Insurance Securitisation.

d) Why there is a need to regulate the Insurance Industry ? Explain briefly.

Marks. 5 Each

Q.2. a) Claim Frequency per Policy is expected to follow a Poisson Distribution with Mean = 0.05. Claim sizes are expected to follow a Lognormal Distribution with Mean = ₹ 1,200/- and Variance = ₹ 22,45,000/-. Calculate Minimum Expected Number of Claims required for Full Credibility, if 98% Probability of being within + 6% of True Premium is observed.

b) List the items to be considered in determining the Credibility of the Experience Loss Cost Estimate.

c) Discuss different types of Treaty Excess Covers.

d) Outline briefly any 5 components of a Re-Insurer’s Loss Reserve.

Marks. 5 Each

Q.3. a) There are four Re-Insurers operating in your Country and you are required to select one for the Re-Insurance Programme of your Company. What considerations will you keep in mind before selecting a Re-Insurer for your Company ?

b) What is an Insurer’s Statutory Surplus ?

How the conservative nature of Statutory Valuation is observed while valuing Assets and Loss Reserves ?

Marks. 10 Each

Q.4. a) Re-Insurance Loss Reserving is more difficult than Primary Insurance Loss Reserving. Do you agree ?

b) In the context of General Insurance Companies, what is meant by short-tailed exposures and long-tailed exposures ?

Give some examples of short-tailed exposure categories.

What methods are normally used by Re-Insurers for Loss Reserving relating to short-tailed exposure categories ?

Marks. 10 Each
Q.5. There are three types of risks. Assume: 60% of the risks are of Type A, 25% of the risks are of Type B, and 15% of the risks are of Type C. Each risk has either one or zero claims per year. A risk is selected at random.

<table>
<thead>
<tr>
<th>Type of Risk</th>
<th>A Prior Chance of Type of Risk</th>
<th>Chance of a Claim</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>60%</td>
<td>20%</td>
</tr>
<tr>
<td>B</td>
<td>25%</td>
<td>30%</td>
</tr>
<tr>
<td>C</td>
<td>15%</td>
<td>40%</td>
</tr>
</tbody>
</table>

a) What is the overall Mean Annual Claim Frequency? 1 Mark.
b) You observe no claim in a year. What is the Probability that the Risk you are observing is of Type A? 2 Marks.
c) You observe no Claim in a year. What is the Probability that the Risk you are observing is of Type B? 2 Marks.
d) You observe no Claim in a year. What is the Probability that the Risk you are observing is of Type C? 2 Marks.
e) You observe no Claim in a year. What is the Expected Annual Claim Frequency from the same Risk? 4 Marks.
f) You observe one Claim in a year. What is the Expected Annual Claim Frequency from the same Risk? 4 Marks.
g) You observe a single Risk over five years. You find 2 Claims in 5 years. What is the Expected Annual Claim Frequency from the same Risk? 5 Marks.

Q.6. a) What do you mean by Capital Asset Pricing Model (CAPM)? Explain the equation with all the terms. 8 Marks.
   What are the problems which arise in applying the CAPM in insurance pricing?
   b) What do you mean by planning? Specify the steps involved in planning process. 8 Marks.
   c) What do you mean by Dynamic Financial Analysis? Briefly outline the steps involved in it. 4 Marks.

Q.7. i) Explain the ‘benchmark’ and ‘ground up’ methods for estimating environmental losses. 8 Marks.
   ii) What are catastrophe models?
       Discuss the 3 major components of a catastrophe model. 12 Marks.

Q.8 i) What is the Actuary’s role in Facultative Certificate Pricing? 5 Marks.
   ii) List the different sources of data for an insurer. What kind of data can each source provide?
       According to you, what should be the qualities of a good data system? 15 Marks.

END