Q.1  
a) State the flat rate reinsurance pricing formula. Explain all the terms used. 5 each  
b) Define the terms operating ratio and combined ratio. 5 each  
c) Define Internal Rate of Return. The cashflows on an investment are as follows: 

<table>
<thead>
<tr>
<th>Year</th>
<th>Cashflow</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>-10,000</td>
</tr>
<tr>
<td>1</td>
<td>800</td>
</tr>
<tr>
<td>2</td>
<td>1,600</td>
</tr>
<tr>
<td>3</td>
<td>11,000</td>
</tr>
</tbody>
</table>

calculate the IRR for this investment. 5 each  
d) List the different components of a reinsurer’s statutory loss reserve. 5 each  

Q.2  
a) A Property insurer is planning to expand its business by writing liability business. How can a reinsurer assist this insurer in achieving its Plan? 5 each  
b) What are the different financial instruments in which a general insurer usually invests in India? 5 each  
c) A study suggests that 5% of men are colorblind and 0.25% of women are colorblind. A colorblind person is selected from a population consisting of 10% men and 90% woman. What is the chance that the colorblind person chosen is a man? 5 each  
d) Outline the 5 items that should be considered in determining the credibility of the experience loss cost estimate. 5 each  

Q.3  
a) Explain Asset - liability matching. Why it is not useful property liability insurance? Discuss. 10 each  
b) A medium size general insurance company mainly selling Automobile insurance is in process of deciding its investment strategy. List the types of investment instruments in which company can invest and outline the basic features of each investment instrument. 10 each  

Q.4  
a) An individual holds two bonds A and B paying annual coupons in arrears. Both bonds have a face value of ₹2000 and 5 years to maturity. The coupon rate for A is 5% p.a. and the coupon rate for B is 9% p.a. The yield to maturity for both is 7% p.a. Calculate the Macaulay duration for the 2 bonds. 10 each  
b) What can be the variables to be used in splitting the reinsurer’s portfolio into homogeneous exposure groups? 10 each  

Q.5  
i) A six - sided die is used to determine if there is a claim. Each side of the die is marked either 0 or 1. ‘0’ denotes no claim and ‘1’ denotes a claim. Two sides are marked zero and four sides are marked one. There is spinner representing claim severity. It has 3 areas marked 2, 5 and 14. The probabilities for each claim size are:

1
Claim size | Probability
---|---
2 | 20%
5 | 50%
14 | 30%

Die is rolled and if a claim occurs, spinner is spun. Calculate the Variance for a single trial of this process.

b) Discuss the three arguments raised against the need for property - casualty insurers to adopt asset liability matching.

c) List any three uses of catastrophe models.

Q.6 a) Reinsurance loss reserving has many of the same problems as Primary Insurance Reserve, but there are also various technical problems that make reinsurance loss reserving more difficult. Discuss.

b) Write a note on Finite or Non traditional reinsurance covers.

Q.7 a) What is the need of regulation in Insurance Industry, Explain.

b) Standard Actuarial models do not work for estimation of environmental liabilities. Do you agree?

c) Define Insurance Securitization. Outline different types of Securitized Insurance Products.

Q.8 a) What is business “Planning?” List out the steps involved in business planning process.

b) What is business “Forecasting”? Briefly explain the two techniques used for business forecasting (formula should be stated for each approach).

c) Explain Dynamic Financial Analysis (DFA).