Multiple-Choice Question (All Multiple-Choice Questions carries Two Marks Each)

Q.1. Insurer is insuring a project having following cashflows. The net present value of the project is:

<table>
<thead>
<tr>
<th>Time (in years)</th>
<th>Amount in INR</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>-100</td>
</tr>
<tr>
<td>1</td>
<td>80</td>
</tr>
<tr>
<td>2</td>
<td>120</td>
</tr>
</tbody>
</table>

(a) 100.0  
(b) 87.2  
(c) 120.0  
(d) 92.8  

Q.2. Clash treaties may be exposed to losses only in case of  
(a) Catastrophic workers compensation accidents  
(b) General household fire incidents  
(c) Single claim on single policy  
(d) Motor fixed benefit policy  

Q.3. Suppose x denotes the number of car accidents in a year. Accidents occur at an average rate of λ. The best fit probability distribution for the accidents is:  
(a) Binomial  
(b) Gamma  
(c) Exponential  
(d) Poisson  

Q.4. Surplus treaty can be described as  
(a) Same percentage of each and every risk  
(b) One percentage for claims and one percentage for premium for all risks  
(c) Percentage of premium and claims above the retention  
(d) Different percentage for all same size risks  

Q.5. Financial reinsurance is used by insurers mainly to  
(a) Provide stabilization  
(b) Provide capacity  
(c) Manage financial result  
(d) Manage large one-off losses  

Q.6. XYZ insurance company writes a premium of INR 1,00,000 at a loss ratio of 65%. If the rate correction factor is 5%, then the expected loss cost is:  
(a) INR 68,000
(b) INR 68,250  
(c) INR 68,500  
(d) INR 68,625

Q.7. Catastrophe event count varies at a rate of 3 and catastrophe event severity is distributed Pareto (8%, 3). What is the variance in annual aggregate catastrophe loss?  
(a) 0.0192  
(b) 0.0170  
(c) 0.0197  
(d) 0.0185

Q.8. Equities with no voting rights are called:  
(a) Unsecured loan stock  
(b) Ordinary shares  
(c) Bonds  
(d) Preference shares

Q.9. Working cover excess treaty can be best described as:  
(a) Layer for which claims activity is rare  
(b) Layer for which claims activity is expected each year  
(c) Layer of an excess treaty with very high deductible  
(d) Layer of a catastrophe excess treaty

Q.10. Catastrophic exposures are often analyzed by CRESTA which are:  
(a) Catastrophic risk elimination and standard target aggregates  
(b) Catastrophic review and stabilizing total aggregates  
(c) Catastrophe risk evaluation and standard total accumulations  
(d) Catastrophe risk evaluating and standardizing target accumulations

Q.11. Which of the following statements is incorrect:  
(a) Binomial distribution has a mean greater than or equal to variance  
(b) Negative binomial has a mean less than or equal to variance  
(c) Gamma is conjugate prior distribution for Poisson  
(d) Gamma-Poisson has a prior density function

Q.12. Which of the following commissions are used as part of experience rating?  
(a) Overriding commission  
(b) Proportional commission  
(c) Sliding scale commission  
(d) Ceding commission

Q.13. Which of the financial statements below is not relevant in evaluating an insurance company:  
(a) Shareholders letter in the annual report  
(b) Shareholding details  
(c) Statement of cash flows  
(d) Balance sheet and income statement

Q.14. If the standard for full credibility is 5000 claims, then the credibility assigned to data with 3000 claims is  
(a) 0.575  
(b) 0.600
(c) 0.775
(d) 0.167

Q.15. The overall mean claim frequency for the below data is:  

<table>
<thead>
<tr>
<th>Type of risk</th>
<th>Priori chance of type of risk</th>
<th>Chance of 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) 23.5%
(b) 12.1%
(c) 25.5%
(d) 64.4%

(Essay type questions: All essay type question carry Ten marks each)

Q.16. Describe the role an actuary can play in operating an insurance company. Detail the role of the actuary in Planning and Forecasting

Q.17. (a) Discuss the various reasons for reporting and settlement delays in motor vehicle claims.
(b) How is the present value and Macaulay duration for a 5 year fixed coupon bond calculated? Explain with the help of an example.

Q.18. (a) Discuss the role an actuary can play in Facultative Certificate pricing.
(b) Write a short note on Risk Based Capital

Q.19. (a) Briefly discuss Benchmark method in context of estimation of entity’s environmental liabilities.
(b) Explain Asset-liability matching concept. How is the concept useful to a Causalty insurance company?

Q.20. What are catastrophe models? Discuss the 3 major components of a catastrophe model.

Q.21. Discuss any 3 rate of return measures that can be used to quantify the profitability of the property-liability insurer, including strengths & weaknesses of each measures.

Q.22. (a) You are given the following information for a class of general insurance business:
   - The number of claims is Poisson
   - The severity distribution is lognormal with parameters $\mu=10$ and $\sigma=1.9$
   - Full credibility is defined as having a 95% probability of being within plus or minus 1% of the true pure premium.
   Calculate the minimum number of expected claims that will be given full credibility.
(b) Write a short note on unearned premium reserve.

End