Multiple Choice: (All Multiple Choice Questions Carries Two marks each.)

Q.1 Given that Total expected loss cost (TELC) = 68250
Primary company premium (PCP) = 100000
Rate correction factor (RCF) = 1.05
Find primary company permissible loss ratio (PCPLR)

a) 0.55  
b) 0.65  
c) 0.75  
d) 0.45

Q.2 In respect of Property Catastrophe treaties the price of a catastrophe treaty should depend upon the :-

a) Attachment point  
b) Cedent’s accumulation of property exposure in localities prone to natural catastrophies  
c) Cedent’s net position on each policy after all other reinsurance  
d) All of the above

Q.3 Which of the following of the reinsurance category is usually medium tailed with respect to claim reporting and development:

a) Treaty casual excess  
b) Treaty property proportional  
c) Treaty property excess higher layers  
d) Casualty aggregate excess

Q.4 Which of the following statements is incorrect:

a) For the Binomial distribution the mean is greater to or equal to the variance.  
b) For the Negative Binomial the mean is less than or equal to the variance.  
c) Gamma is called a conjugate prior distribution for the Poisson.  
d) For Gamma-Poisson the prior density function is also Gamma.

Q.5 Which of the following relationships is correct?

a) Macaulay Duration=\(\frac{1}{1+r}\) * Modified Duration  
b) Modified Duration=(1+r) * Macaulay Duration  
c) Modified Duration=(1/r) * Macaulay Duration  
d) Modified Duration=\(\frac{1}{1+r}\) * Macaulay Duration

Q.6 The standard for full credibility is 683 claims and one has observed 300 claims. How much credibility can be assigned to this data?

a) 55%  
b) 66%  
c) 77%  
d) 44%
Q.7 In which of the following Credibility is not expected to increase?
   a) Larger Quantity of observations
   b) Increase in the prior mean
   c) Increase in the variance of hypothetical mean
   d) None of the above

Q.8 If 14% of actuarial students take exam seminars and 8% of actuarial students both take exam seminars and pass the exam, what is the chance of a student who has taken an exam seminar passing his exam?
   a) 47%
   b) 52%
   c) 57%
   d) 62%

Q.9 Which of the following Financial Statements provides a snapshot of the company’s financial position on a specified date?
   a) Income statement
   b) Balance sheet
   c) Cash flow statement
   d) Letter to shareholder in annual report

Q.10 Which of the following methods is not included in the benchmark method for estimating environmental losses?
   a) Aggregate loss development method
   b) Claim department method
   c) Market share method
   d) Survival loss ratio method

Q.11 Any strategy that eliminates price risk and coupon reinvestment risk on a fixed income portfolio is known as:
   a) Balancing
   b) Immunization
   c) Securitization
   d) None of the above

Q.12 Which of the following instruments does not normally form part of casualty insurance company’s portfolio?
   a) Bonds
   b) Loan to Policy holders
   c) Equities
   d) Real estate

Q.13 Under Insurance regulatory system which of the following is not the Loss Reserving test?
   a) One year reserve development to surplus
   b) Two year reserve development to surplus
   c) Estimated current reserve deficiency to surplus
   d) Change in policyholder’s surplus

Q.14 Which of the following is the ratio that measures financial leverage or Capital structure?
   a) Current ratio
   b) Leverage ratio
   c) Return on equity
   d) Tobin’s Q
Q.15 Which of the following is the most likely cause of general insurance company’s failure?
   a) Rapid growth
   b) Deficient loss reserves
   c) Alleged fraud
   d) Reinsurance failure

   Essay-type questions : (All essay-type questions carries Ten marks each)

Q.16 In the context of reinsurance explain the following:
   a) Treaty proportional covers
   b) Treaty excess covers
   c) Catastrophe covers

Q.17 Under claim report and payment lags, for historical analysis and the estimation methods
   of different exposure categories according to the length of average claim report lags, the
   following methods may be used.
   a) Method for short tailed exposure categories
   b) Method for medium-tailed exposure categories
   c) Method for long tailed exposure categories
   Explain each of the above methods

Q.18 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 priori 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>

   Answer the following questions:
   a) What is the overall mean annual claim frequency?
   b) You observe no claim in a year. What is the probability that the risk you are
      observing is of Type “A”?
   c) You observe no claim in a year. What is the probability that the risk you are
      observing is of Type “B”?
   d) You observe no claim in a year. What is the probability that the risk you are
      observing is of Type “C”?
   e) You observe no claim in a year. What is the expected annual claim frequency
      from the same risk?
   f) You observe one claim in a year. What is the expected annual claim frequency
      from the same risk?

Q.19 The annual number of claims for an individual policy has Poisson (μ) distribution. The
   variability in μ among policies is modeled by assuming that on the portfolio, individual values
   of μ have a Gamma(α, β) distribution. Find the mixed distribution for annual number of claims
   for each policy of the portfolio.

Q.20 Write short notes on:
   a) Modified Duration
   b) Convexity
   c) Effective Modified Duration
   d) Effective Convexity
Q.21 Explain the Financial and underwriting variables that may be used in Dynamic Financial Analysis (DFA).

Q.22 Describe the Asset Liability matching concepts. How is this concept useful for a casualty insurance company? What is the impact of Asset Liability mismatch on the company?

END