ACTUARIAL SCIENCE EXAMINATION

FOUNDATIONS OF CASUALTY ACTUARIAL SCIENCE - PART II

Time : 3 Hours　　　　　　　　　　　　　　　　　Total Marks : 100

Multiple choice :　　　　　(all questions carry 2 marks each).

1. Expand the following abbreviations in the context of reinsurance.
   A. RBF
   B. RDF
   C. RIXL
   D. RCF

2. The mean and the variance is the same in
   A. Normal Distribution
   B. Binomial Distribution
   C. Poisson Distribution
   D. Gamma Distribution

3. Which of the following does not constitute a catastrophe
   A. Earthquake
   B. Tsunami
   C. Outbreak of an epidemic
   D. A large fire loss.

4. The following are components of a Reinsurance Loss Reserve.
   A. Case reserves reported by the ceding companies.
   B. Reinsurers' Additional reserves on individual claims.
   C. Actuarial estimates of future development on A and B above.
   D. Actuarial estimate of pure IBNR.
   E. Discount for future investment income.
   F. Risk Load.

   Which of the above six, if any, is not a component of Reinsurance Loss Reserve?

5. Which of the following instruments does not normally form part of a casualty insurance company's portfolio?

   A. Bonds
   B. Loans to policy holders
   C. Equities
   D. Real Estate

6. Among the problems with statutory financial statements, which of the following, if any, is not relevant

   A. The equity in the unearned premium reserve is not recognized.
   B. Bonds are valued at amortized rather than market values.
   C. Some assets are not included in statutory surplus, such as non-admitted reinsurance.
   D. Loss and loss adjustment expense reserves are carried at the present value rather than at the sum of estimated future payments.

   Which of the above, if any, is wrong?

7. Which of the following is incorrect?

   A. Current ratio   = Current Assets minus current liabilities.
   B. Cash ratio   = Cash plus marketable securities divided by current liabilities.
   C. Leverage Ratio = Debt divided by equity.
   D. Return on Equity= Net income divided by Equity.

8. The following are the important variables for partitioning a reinsurance portfolio into reasonably homogeneous Exposure Categories.

   A. Line of business – property, casualty, bonding, ocean marine, etc.
   B. Type of contract – facultative, treaty, etc.
   C. Type of reinsurance cover – quota share, surplus share, excess per-risk etc.
   D. Primary line of business for casualty.
   E. Attachment point – for casualty
   F. Type of cedant small, large or E&S company.

   Which of the above, if any, is not relevant?

9. Given the following information determine the indicated rate per unit.

Frequency per exposure unit	0.35
Severity	150
Fixed Expenses	125
Variable Expense factor	25%
Profit and contingency Factor	10%

   The answer is :

   A. Less than 200
   B. 200 to 225
   C. 225 to 250
   D. Above 250

10. The most important factor in determining the decision to invest in Equity of a Company quoted on the stock exchange is

   A. Geographical Location of the Company.
   B. Quality of its Management.
   C. Rating assigned to the company by a renowned rating agency
   D. Product being produced.

11. Following are the items to be considered for determining the credibility of the experience loss cost estimates

   A. The accuracy of the estimates of claims cost inflation.
   B. The accuracy of the estimates of loss development
   C. The accuracy of the subject premium on level factors.
   D. The instability of the loss cost, or loss cost rate, over time.
   E. The possibility of changes in the underlying exposure over time.
   F. The excess coverage, the possibility of change in the distribution of policy limit over time which of the items is wrongly stated?

12. State whether the following statements are true of false:

   A. Credibility theory provides tools to deal with randomness of data that is used for predicting future events or costs.
   B. If you have data in excess of the Full Credibility Criterion, then credibility will be reduced below 100%.

13. The following reinsurance categories are usually long-tailed with respect to Claim Reporting and Development

   A. Treaty Casualty Excess.
   B. Facultative property
   C. Treaty casualty proportional
   D. Facultative casualty
   E. Casualty aggregate excess.

   Which of the above, if any, is not usually long-tailed?

14. Which of the following causes can be the main cause of Insolvency of a casualty insurance company?

   A. Reinsurance Failure
   B. Catastrophe Loss
   C. Deficient loss reserves
   D. Overstatement of assets

15. Reinsurance can take any of the following forms

    A.   Facultative certificate
    B.   Facultative Agreements or Programmes
    C.   Treaties
    D.   Treaty Proportional cover
    E.   Treaty shortfall cover
    F.   Catastrophe Cover

Which of the above, if any, is wrongly mentioned?

Essay type questions : (Each question carry 10 Marks)

16. You are given the following:

    i)   The number of claims is Poisson distributed
    ii)   Claim severity has the following distribution.

Claim Size	Probability
10	0.50
20	0.30
50	0.20

Determine the number of claims needed so that the total cost is within 20% of the expected cost with 95% probability.

17. Enumerate the 13 steps in the rating procedure followed for reinsurance pricing. Which of the above steps is usually performed only for more complex contracts?

18. Write short notes on
    a)   Unearned Premium Reserve
    b)   Insurance Securitization

19. You are given the following information for a group of insured :

    i)   Prior Estimate of expected total losses Rs. 2,00,00,000
    ii)   Observed total losses Rs. 2,50,00,000
    iii) Observed number of claims 10,000
    iv) Required number of claims for full credibility 17,500

Calculate a credibility weighted estimate of the group expected total losses.

20. a)   Assume that 5% of men are colourblind, while 25% of women are colourblind. A colourblind person is picked up out of population of 10% of men and 90% of women. What is the chance that the colourblind person chosen is a man?

b) You are given the following information :-

City	Percentage of Total Drivers	Person of Drivers Accident-free
Mumbai	40%	80%
Delhi	25%	85%
Kolkata	20%	90%
Chennai	15%	95%

A Driver is picked up at random. If the driver is accident free what is the chance that the driver is from Mumbai?

21. Describe the role an actuary can play in operating an insurance Company. Detail the role of the actuary in Planning and Forecasting.

22. Describe the Asset-Liability Matching concept. How is the concept useful to a casualty insurance company? What is the impact of mismatch between assets and liabilities?

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