

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. The number of steps to be followed in the process of reinsurance pricing are:-
- A. 15
 - B. 10
 - C. 13
 - D. 12

Which one is correct?

2. Elaborate in full form what the following abbreviations stand for
- A. IBNER
 - B. PCPLR
 - C. RELC
 - D. RIXL
3. Actuaries commonly use the following distributions to model the number of claims
- A. Normal Distribution
 - B. Poisson Distribution
 - C. Binomial Distribution
 - D. Negative Binomial Distributions.

Which of the above is not commonly used?

4. The following are the components of insurance loss reserves:-
- A. Case reserves reported by the ceding company.
 - B. Reinsurer's additional reserves on individual claims.
 - C. Actuarial estimate of Future development on A and B
 - D. Actuarial Estimate of pure IBNR.

Which of the above four, if any, is incorrect?

5. Given the following information, determine the indicated rate per unit
- | | |
|-------------------------------|------|
| Frequency per exposure units | 0.40 |
| Severity | 200 |
| Fixed expenses | 125 |
| Variable expense factor | 20% |
| Profit and contingency factor | 10% |

The answer is

- A. Less than 250
 - B. 250 to 500
 - C. 500 to 750
 - D. Above 750
6. Following are the reinsurance categories that are usually short-tailed with respect to claim reporting and development.
- A. Treaty Property Proportional
 - B. Treaty Property Catastrophe
 - C. Treaty Property Excess
 - D. Facultative casualty

Which of the above four, if any, is wrong?

7. In which of the following should credibility be expected to increase?
- A. Increase in the prior mean
 - B. Increase in the variance of hypothetical mean.
8. Investment income earned in the year includes the following items:-
- A. Interest and Dividend income actually received
 - B. Interest income accrued
 - C. Appreciation on various investments which is unrealised.
 - D. Profit on realisation of investments.

Which of the above, if any, is incorrect?

9. Which of the following is most likely to be the cause of general insurance company failure?
- A. Rapid Growth
 - B. Deficient loss reserves
 - C. Alleged fraud
 - D. Reinsurance Failure

10. Some of the most important variables in dynamic financial analysis model include the following:-
- Interest rates
 - Inflation
 - Equity Market performance
 - Mortgage prepayment patterns

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

11. Which of the following is incorrect?
- Current Ratio = Current Assets divided by Current Liabilities
 - Leverage Ratio = Debt divided by equity
 - Return on Equity = Net income divided by equity.
 - Cash ratio = Cash divided by current liabilities.

Which of the above, if any, is incorrect?

12. If, Support : $X > 0$
 Parameters : $b > 0$ $q > 0$
- c.d.f. $F(x|b,q) = 1 - \left(\frac{b}{b+x}\right)^q$
- p.d.f. $f(x|b,q) = \frac{q b^q}{(b+x)^{q+1}}$

The Distribution is

- Poisson
- Pareto
- Gamma
- Negative Binomial

Which of the above options is correct?

13. For N observations, the Biihlmann Credibility is

$$Z = N/(N+k)$$

What do Z and k stand for?

14. Financial statements useful in the evaluation of a general insurance company are the following:
- Balance Sheet
 - Income Statement
 - Statement of Cash Flows
 - Details of Shareholding

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

15. The standard for full credibility is 2,000. How much credibility is assigned to 300 claims?
- 15%
 - 17.5%
 - 38.7%
 - 37.8%

Essay type questions : (Each question carry 10 Marks)

16. You are given the following:-
- For a given risk, the number of claims for a single exposure will be 1 with probability of $\frac{4}{5}$; or 2 with probability of $\frac{1}{5}$.
 - If only one claim is incurred the size of the claim will be 50 with probability $\frac{3}{4}$ or 200 with probability $\frac{1}{4}$.
 - If two claims are incurred, the size of each claim independent of the other will be 50 with probability 60%; or 150 with probability 40%.
- Determine the variance of the pure premium for the risk.
17. Explain the concepts of classical credibility dealing particularly with Full Credibility for frequency, severity and pure premium; and partial credibility when available data is less than the data that is needed for full credibility.
18. a) Discuss the suitability of 'Real Estate' as an investment instrument for a property and casualty (general insurance) company.
b) What role the dividend on an equity share plays in determining the suitability of a particular equity for investment of funds of a general insurance company?
19. Write short notes on:
- Internal rate of return
 - Immunisation
20. a) What do you understand by the term 'net worth' in the context of a general insurance (property and casualty) company?
b) Describe broadly how 'net worth' is measured.
c) Why 'net worth' is required to be determined?
21. a) What role does reinsurance play in successfully running a general insurance company?
b) Describe the various forms that reinsurance arrangements can take.
22. a) Describe the role "capital" plays in running a general insurance Company.
b) What determines the minimum capital requirement?
c) State the concepts of risk based capital (RBC).