

ACTUARIAL SCIENCE EXAMINATION

FOUNDATIONS OF CASUALTY ACTUARIAL SCIENCE - PART I

Time : 3 Hours

Total Marks : 100

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

1. Which of the following statements, if any is not correct?
 - A. Actuaries begin with the final problem they work backwards to devise an optimal solution.
 - B. Actuaries seek optimal solutions, not perfect ones.
 - C. The actuary considers all constraints, whether they seem relevant or not.
 - D. The market place is the ultimate arbiter of the actuary's performance.

2. What does ELCF stand for?
 - A. Expense Leverage Calculation Factor
 - B. Equipment Location Claim Formula
 - C. Excess Loss Cost Factor
 - D. Excess Loss Claim Finder

3. Which of the following statements is untrue?
 - A. Credibility must not be less than zero or greater than one.
 - B. Loss prevention completely eliminates the probability or frequency of a loss.
 - C. A good individual risk rating system appropriately balances risk sharing and risk bearing.
 - D. Incurred losses in a year are equal to the sum of paid losses and ending claim liability reduced by the beginning claim liability.

4. If the rate per unit of exposure (R) is defined as $R = \frac{P + F}{1 - V - Q}$
 and Loss and loss adjustment expenses .

| | |
|-------------------------------|-------------|
| pure premium | = Rs. 7,500 |
| Fixed expense per exposure | = Rs. 1,250 |
| Variable expense factor | = 17.5% |
| Profit and contingency factor | = 5% |

R will work out to :

 - A. Less than Rs. 10,000
 - B. between Rs. 10,000 to Rs. 10,500
 - C. between Rs. 10,500 to Rs. 11,000
 - D. Above Rs. 11,000

5. Severity can be defined as
- A. Highest possible amount of loss
 - B. Average loss per unit
 - C. Largest amount of loss occurred in an accounting year
 - D. Total amount of loss in an accounting year.

Which one of the above is correct?

6. If incurred losses in a year are Rs. 10 lakhs
Paid losses in the year are Rs. 8 lakhs
Beginning loss reserves are Rs. 2 lakhs

The year ending loss reserves are

- A. Rs. 4 lakhs
 - B. Nil
 - C. Rs. 16 lakhs
 - D. Rs. 20 lakhs
7. The binomial distribution function is expressed as.

$$P_r(k) = \binom{N}{k} p^k \times q^{n-k}$$

What do N, K, p and q stand for?

8. The specific exposure unit for a given type of insurance depends on the following factors among others.
- A. Reasonableness
 - B. Ease of determination
 - C. Immunity from change
 - D. Historical practice

Which of the above, if any is untrue?

9. The different ways of categorising risk are as follows:-
- A. Objective Risk
 - B. Subjective Risk
 - C. Pure Risks
 - D. Impure Risks

Which of the above, if any, is untrue?

10. The methods of risk control are as under.
- A. Exposure Avoidance
 - B. Loss Prevention
 - C. Loss Reduction
 - D. Aggregation of Exposure Units.

Which of the above, if any, is untrue?

11. The pure premium method of ratemaking has the following characteristics:-
- A. It is based on exposure
 - B. It requires existing rates.
 - C. It does not use on-level premium
 - D. Produces indicated rates.

Which of the above, if any is not correct?

12. Which of the following equations is incorrect?
- A. $Assets = Liabilities + Owner's Equity$
 - B. $Revenue = Income + Expenses$
 - C. $Contributed Capital = Owner's Equity + Retained earnings$
 - D. $Income = Change in Assets - Change in Liabilities - Change in Contributed Capital + Dividends to owner$

13. The following are the actuarial criteria for selecting rating variables:-
- A. Accuracy
 - B. Homogeneity
 - C. Credibility
 - D. Reliability

Which of the above, if any, is not an actuarial criterion?

14. What does ARMA model stand for?
- A. Automatic Revenue Management Accounting
 - B. Average Rule of Moving Autoregression
 - C. Autoregressive Moving Average
 - D. Accounting Resources Management Analysis

15. Actuaries are required in the property and casualty (general insurance) for
- A. Selling Policies
 - B. Pricing of Policies
 - C. Working out Loss Reserves
 - D. Ensuring Solvency

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

Essay type questions : (All questions carry 10 Marks each)

16. For each of the following, discuss the relative merits of the pure premium and loss ratio methods.
- | Coverage | Exposure Base |
|-------------------|----------------------|
| Auto Liability | Car Year |
| Home Owners | Dwelling year |
| Product Liability | Annual Sales |
17. Describe the Triangular method used to determine ultimate loss levels. Why is it most commonly used?
18. Describe Individual Risk Rating Systems explaining the attributes of Good Systems.
19. Describe in detail the social criteria for selecting rating variables.
20. a) Define the term liability explaining the essential characteristics an obligation has to satisfy for being considering a Liability.
b) What tests are required to determine if a contingent liability should be recognised in the balance sheet?
21. Write short notes on:
A. Utility Theory
B. Risk Management
22. a) What is the importance of data in the management of a general insurance company?
b) Illustrate the importance of data with reference to claim management including loss reserves.

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