ACTUARIAL SCIENCE EXAMINATION

FOUNDATIONS OF CASUALTY ACTUARIAL SCIENCE – PART-I

Time : 3 Hours   Total Marks : 100

Multiple choice : (All Multipal Choice questions carry 2 marks each).

1. Given that :
    Pure premium = Rs. 50.00
    Fixed expenses per exposure = Rs. 13.75
    Variable expense factor = 10%
    Profit and contingency factor = 5%
    The rate per unit exposure will be :
    A   Rs. 65.00
    B   Rs. 70.00
    C   Rs. 75.00
    D   Rs. 80.00

2. Which of the following statements about the loss Ratio Method of the rate making process is incorrect?
    A)   Based on premium
    B)   Requires existing rates
    C)   Uses on-level premium
    D)   Produces indicated rates

3. Which of the following is not an attribute of good individual risk rating system?
    A   Serve the needs of the organisation using them
    B   Appropriately balance risk sharing and risk bearing
    C   Are subject to internal or external manipulation
    D   Are simple to administer.

4. Using 'Z' for credibility and 'E' for size of risk which of the following mathematical relationships doesn't appropriately represent the credibility criteria?
    A $0 < Z < 1$

    B $\dfrac{dz}{dE} < 0$

    C $\dfrac{d}{dE}\left(\dfrac{z}{E}\right) < 0$

    D   None of the above

5. Which of the following dates is not one of the key dates defined for loss reserve estimation process?
   A   Accident date
   B   Date of first Information Report (F I R)
   C   Accounting date
   D   Valuation date

6. Which of the following statements is correct?
   A   A risk neutral decision maker would have a utility function that is exponential.
   B   A risk averse decision maker would have a utility function that decreased at a progressively lower rates or had a positive second derivative.
   C   A decision maker who favoured risk would have a utility function that increased at a progressively faster rate or had a positive second derivative.
   D   All the above statements are correct.

7. Given that :
   Change in assets = Rs. 10,000
   Change in liabilities = Rs. 5,000
   Change in contributed Capital = Rs. 2,000
   Dividend to owners = Rs. 1,000
   Which of the following will be the Income under the Income statement that documents the financial performance of the firm?
   A   Rs. 5,000
   B   Rs. 10,000
   C   Rs. 4,000
   D   Rs. 8,000

8. Once an insurer has satisfied its obligation to the policyholder the company may pursue recoveries from third parties for some part of the indemnity amount paid to the policyholder. This right of recovery is called:
   A   Subrogation
   B   Loss development
   C   Salvage

9. Which of the following methods of loss reserve estimation methods estimates ultimate loss by adding together actual reported loss with expected future incurred development?
   A   Bornhuelter – Ferguson method
   B   Average claim paid projection method
   C   Average incurred claim projection method.

10. Which of the following is not a characteristic of an ideally insurable exposure?
    A   The exposure transferred should be subject to pure risk.
    B   The exposure should reduce total risk management costs.
    C   The loss should be accidental from the viewpoint of the insured.
    D   The expected loss over some reasonable period of time should be estimable.
    E   None of the above.

11. Under loss ratio method of the ratemaking process the following information is available:
    Total premium related expense factor = 0.25
    Profit and contingency factor = 0.05
    Ratio of non-premium related expenses to losses = 0.075
    Calculate the target Loss ratio and indicate the correct answer from below :
    A   0.65
    B   0.86
    C   0.76
    D   0.55

12. Which of the following is not a broad goal of the manual ratemaking process?
    A   To determine rates that will, when applied to the exposures underlying the risk being written.
    B   Provide sufficient funds to pay expected losses and expenses
    C   Maintain an adequate margin for adverse deviation
    D   Produce a reasonable return on funds provided by investors.
    E   None of the above.

13. Which of the following is not one of the basic types of prospective individual risk rating system?
    A   Schedule rating
    B   Experience rating
    C   Some type of composite rating
    D   None of the above.

14. Which of the following statements about retrospective individual risk rating is untrue?
    A   The length of the retrospective rating period is usually more than 3 years.
    B   The shorter the period, the more responsive the plan will be to changes that truly affect loss experience.
    C   Retrospective rating plans may limit losses per occurance.
    D   Retrospective rating plans may have maximum or minimum premium charges and need to be corrected for off-balance.

15. Which of the following equations is incorrect?
    A   Income = Change in Retained Earnings + Dividends to owners
    B   Retained Earnings = Owner's equity − Contributed Capital
    C   Owner's equity = Assets - Liabilities
    D   Incurred losses = Paid losses + Ending claim Liability.

Essay type questions (All questions carry 10 marks each)

16. Pure premium and loss Ratio methods of ratemaking process will produce identical rates when applied to identical data and using consistent assumptions. Demonstrate the equivalence of the two methods.
    Also, identify the practical differences between the two methods and suggest three guidelines for selection of appropriate method.

17. The effect of increase in the Severity trend in excess layers with the increase in lower bound of the layer is sufficient to produce a general upward movement in increased limit ratemaking factors.
    Briefly describe the three methods available for the review of increased limit experience.

18. List the steps that should be taken to design an individual risk rating system.

19. i) State the four basic principles published by the Casualty Actuarial Society (CAS) regarding property and casualty loss and loss adjustment expense reserves.
    ii) Describe the four phases of approach to a reserve valuation problem.

20. Criteria for selecting rating variables may be summarised into actuarial, operational, social and legal categories. Explain in details about the actuarial criteria for selecting variables.

21. Write short notes on the following accounting statements :
    i) The Balance Sheet
    ii) The Income Statement

22. Explain risk financing and three general categories in which the techniques of risk financing fall.

.... **The End** ....