

# 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. The characteristics of an ideally insurable exposure are as follows :-
- A. The exposure transferred should be the subject of pure risk.
  - B. There should be a large number of independent entities with similar exposures.
  - C. The insured loss should be definite or determinate in time, place, cause and amount.
  - D. The expected loss over some reasonable period of time need not be estimable.
  - E. The loss should be accidental from the viewpoint of the insured.

Which of the above is not true?

2. Is the following statement **true** or **false** ?  
Pure premium equals the product of frequency per unit of exposure and number of exposures.

3. In the formula :

$$T = \frac{1-V-Q}{1+G}$$

What do T, V, Q and G stand for ?

4. What do the following stand for ?
- A. CAS            B. IBNR            C. ALAE            D. NCCI
5. Which of the following are generally reviewed as the actuary's primary responsibilities in rate-making?
- A. Pure Premium
  - B. Affordability of coverage
  - C. Desired level of profit
  - D. What the competition is charging
  - E. Changes in applicable income tax laws
  - F. Anticipated marketing expenses
  - G. Relationship between price and demand for coverage.

Credibility has the following criteria that must be met.

- A. Credibility must not be less than zero or greater than one.
- B. Credibility should decrease as the size of risk decreases all else being equal.
- C. The percentage change for any loss of a given size should increase as the size of risk increases.

Which of the above criteria is incorrect ?

Which of the following dates, if any, is not relevant for estimating IBNR

- A. Accident Date
- B. Report Date
- C. Recorded Date
- D. Accounting Date
- E. Valuation Date

Which of the following statements is incorrect?

- A. Incurred Losses = Paid Losses + Ending claim liability.
- B. Assets = Liability + Owners' Equity
- C. Income = Revenue - Expenses
- D. Owner's Equity = Contributed Capital + Retained Earnings

Which of the following statements is incorrect?

- A. A risk neutral decision maker would have a utility function that is linear.
- B. A risk averse decision maker would have a utility function that increased at progressively higher rates or had a positive second derivative.

0. Which of the following statements is untrue?

- A. Objective risk is the risk that exists in nature and is the same for all persons or entities facing the same situation.
- B. Subjective risk is each person's or entity's estimate of objective risk.
- C. Pure risk exists where there is chance of either gain or loss of the same amount.

1. Following means are adopted for Risk Control

- A. Exposure avoidance
- B. Loss Prevention
- C. Loss Reduction
- D. Automation

Which of the above, if any, is untrue?

12. An obligation satisfies the accounting definition of a liability if it possesses the following characteristics.
- An obligation involves a possible future sacrifice of resources at a specified or determinable date.
  - The firm has little or no discretion to avoid the transfer.
  - The transaction or event giving rise to the obligation has already occurred.
  - The occurrence of the event giving rise to the obligation may or may not arise in the future.

Which of the above, if any, is incorrect?

13. The attributes of a good rating system are as under :-
- Serves the need of the organization using
  - Need not balance risk sharing and risk bearing.
  - It is simple to administer.
  - It is easy to understand

Which of the above, if any, is incorrect?

14. What does CAPM stand for
- Company Account Profit Margin
  - Capital Asset Pricing Model
  - Control Analysis Payout Mechanism
  - Changed Account Payment Method

15. In loss reserving the focus is on grouping data that displays similar
- Loss emergence pattern – the length of time between loss occurrence and report.
  - Loss settlement pattern – the length of time between the loss report and settlement.

Which of the following statement is correct?

- Both are wrong
- (a) is wrong
- (b) is wrong
- Neither (a) nor (b) is wrong.

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

16. What do actuaries do and why is their specialized knowledge so important?

17. a) What are the two alternative methods used for rate making?  
 b) What are the practical differences between the two?  
 c) What method you will use for a new line of business and why?
18. The following triangle of cumulative loss payment represents the loss experience of the company during the years 2002 to 2008. Estimate losses that can be expected in 2009 excluding those arising out of the business underwritten in 2009.

Accident year	Age in months						
	12	24	36	48	60	72	84
2002	22,603	40,064	54,301	64,114	71,257	75,950	78,224
2003	22,054	43,970	58,737	71,841	78,076	81,267	
2004	20,166	39,147	51,319	60,417	66,402		
2005	19,297	37,355	50,391	62,347			
2006	20,555	42,898	62,832				
2007	17,001	33,568					
2008	11,346						

19. What are the categories used for selecting rating variables? Enumerate the criteria under each of the category.
20. Enumerate the steps that need to be taken to design an individual risk rating system.
21. Write short notes on  
 a) The overlap fallacy  
 b) Subrogation
22. Discuss the attributes of a good Individual risk rating system.

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