October, 2011

SPECIALISED DIPLOMA / CERTIFICATE EXAMINATION
(CASUALTY ACTUARIAL SCIENCE-NON LIFE)
FOUNDATIONS OF CASUALTY ACTUARIAL SCIENCE
- PART II

[ Time : 3 Hours ]
[ Total Marks : 100 ]

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

Q.1 Actuaries commonly use the following distributor to model the severity
   a) GAMMA distributor
   b) Log normal distributor
   c) Poisson distributor
Which of the above is not commonly used.

Q.2 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 investment which is unrealised.
   d) Profit on realisation of investment
Which of the above, if any, is incorrect?

Q.3 The standard for full credibility is 2000, How much credibility is assigned to 300 claims
   a) 15%
   b) 17.5%
   c) 38.7%
   d) 37.8%

Q.4 The items to be considered for determining the credibility of the experience to cost estimate
are as follows :
   a) The accuracy of the estimates of claim cost inflation
   b) The accuracy of the estimates of low development
   c) The accuracy of the subject premium on level factors
   d) The stability of the loss cost or loss cost rate, over time
Which of the above if any, is not relevant?
Q.5 Which of the following items does not appear in the Balance Sheet of a non-life insurance company?
   a) IBNR
   b) General Reserve
   c) Management Expense
   d) Unexpired premium reserve

Q.6 The observed claim frequency is 175. The credibility to this set of date is 30%. The complement of credibility is given to the prior estimate of 250. Which of the following is the new estimate of claim frequency.
   a) 227.50
   b) 217.50
   c) 237.50
   d) 207.50

Q.7 Given that:-
   \[ N = \text{Catastrophe event count} \quad \text{Poisson} [5] \]
   \[ X = \text{Catastrophe event severity} \quad \text{Pareto} [6\%, 3] \]
   \[ L = \text{Annual aggregate Catastrophe loss} \]
   Calculate \( \text{Var}(L) \) and choose the correct answer
   a) 0.018
   b) 0.09
   c) 0.19
   d) 0.23

Q.8 Which of the following equations is incorrect.
   a) Current Ratio = Current liabilities divided by Current asset
   b) Cash Ratio = (Cash + Marketable Securities) / Current liabilities
   c) Asset Turnover = Annual Sales / Asset
   d) Tobin Q's = Market Value of the form / Replacement Values.

Q.9 In which of the following, credibility is not repeated to increase
   a) Larger quantity of observations
   b) Increase in prior mean
   c) Increase in the variance of hypothetical mean
   d) None of the above
Q.10 What is the full form of “GAAP”
   a) Generally Accepted Accounting Principle
   b) Generally Accepted Actuarial Principles
   c) General Accounting and Audit Practices
   d) Generally Accepted Accounting Practices

Q.11 Of the ratio listed below, which cannot be classified as profitability test
   a) Two year operating Ratio
   b) one year reserve development to surplus
   c) Investment yield
   d) Change in Policy holders surplus

Q.12 Any strategy that eliminates price risk and coupon reinvestment risk on a fixed income
   portfolio is known as :-
   a) Balancing
   b) Immunization
   c) Securitization
   d) None of the above

Q.13 Financial statements that provide the financial activities of an insurance company can be
   utilised by the following interested parties
   a) External Investors
   b) Municipale Corporation
   c) Regulators
   d) Internal Decision Makers

Which of the parties, if any, has least interest in the statement.

Q.14 Select the correct duration for a bond with Rs. 1,000 face value with an annual coupon rate at 12%. The
   bond has a yield to maturity of 9%, reflecting current interest rate on five year bonds.
   a) 4.192
   b) 4.102
   c) 4.092
   d) 3.090

Q.15 Which one, of the listed below, is the correct formula for CAPM [Capital Asset Pricing Model].
   a) $E (r_m) = r_f + B [E (r_a) - r_f]$
   b) $E (r_a) = r_f + B [E (r_m) - r_f]$
   c) $E (r_a) = B [r_f + B (E (r_m) - r_f)]$
   d) $E (r_a) = B (r_f) + B [E (r_m) - E (r_f)]$
Essay-Type Questions: (All questions carry 10 Marks Each).

Q.16 Explain 13 step program to reinsurance pricing happens with specific reference to pricing of “Working Cover Excess Treaties”.

Q.17 Write Short Notes on:
   a) Dynamic Financial Analysis
   b) Valuation of General Insurance Company

Q.18 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.

Q.19
   i) Policy Period priced = 2011
   ii) Exposure: General liability premises/oprations
   iii) Policy limit = Rs. 2,000,000 (no aggregate)
   iv) PCP = 5,50,000 (estimated for 2011)
   v) BLP (at Rs. 100,000 limit) = 2,00,000 (estimated for 2011)
   vi) PCPLR = 70% (Excluding UALAE)
   vii) Attachment Point = 5,00,000
   viii) Reinsurance limit = 1,500,000
   ix) ALAE is covered prorata.
   x) RCR = 25%
   xi) RBF = 5%
   xii) RIXL = 15%
   xiii) RTEA = 20%
   xiv) ROF = 0.80

ISO INCREASED LIMIT FACTOR
   i) Policy Limit           ILF without Risk load
   ii) 1,00,000               1.0000
   iii) 5,00,000              1.9077
   iv) 2,00,000               2.4264
   a) Calculate
      PURELC
      RP
b) Provide meaning or full form at the above abbreviations and also any abbreviation used in the calculation

Q.20 Write Short Notes on :-
   a) Internal Rate of Return
   b) Immunization

Q.21 a) Describe the Role “Capital” Plays in running a general insurance company.
   b) What determines the minimum capital requirement.
   c) State the concept of Risk Based Capital.

Q.22 There are two primary classes of methodologies for estimating on entity’s environmental liabilities viz. benchmark and ground-up.
List all the methods available in each of the above grouping and also briefly explain those methods.

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