"QUESTION PAPER MUST BE ATTACHED ALONGWITH THE ANSWER BOOK."

A-3

November, 2016

SPECIALISED DIPLOMA EXAMINATION
(CASUALTY ACTUARIAL SCIENCE NON-LIFE)
BASIC RATEMAKING

Reg. No. | | | | | | | | | | |

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

Answer EIGHT questions only. Q. No. 10 is compulsory which carries 16 marks.
Any SEVEN questions from Q. No. 1 to Q. No. 9 which carries 12 marks each.

Marks

Q.1. Answer **any three** of the following: 4 each

a) List out Basic Insurance Ratios

b) Give definition for four kinds of premiums

c) Write short notes on Rating Algorithms

d) Give note on non proportional reinsurance.

Q.2. Answer **any three** of the following: 4 each

a) Distinguish between Adverse Selection and Favourable Selection

b) What is case incurred loss and how it is related to Paid losses.

c) Calculate the Loss Elimination Ratio for the following table of ground-up homeowners

Losses for a $250 deductible. Use Discrete Case, clearly show the figures arrived at, in a tabulated form and work out the results)

Size of Loss Distribution:

Size of Loss	**Reported Claims**	**Ground-up Reported Losses**
$ <=X< $ 100	3200	$240365
$ 100 <=X< $ 250	1225	$207588
$ 250 <=X< $ 500	1187	$463954
$ 500 <=X< $ 1000	1845	$1551938
$ 1000 <=X<	2543	$11140545
TOTAL	**10000**	**$13604390**

d) Write notes on Distortion

Q.3. Answer **any three** of the following: 4 each

a) Describe types of external data and their relevance in rate making.

b) What are the accounting information required for rate making?

c) Explain methods of aggregating exposure and defining exposures.

d) Describe the criteria that should be considered when selecting an exposure base.

Q.4. Answer **any two** of the following: 6 each

a) Write a note on Permissible Loss Ratios (PLR)

b) Explain two basic approaches for determining an overall rate level

c) Describe the importance of charging equitable rates.

Q.5. Answer **any two** of the following: 6 each

a) Calculate the coinsurance penalty in respect of the following, given the following details:

Value of Home : Rs. 500000

Coinsurance Requirement: 80%

Home Insured For: Rs. 300000

i) For Loss Rs. 200000

ii) For Loss Rs. 450000

iii) For Loss Rs. 300000

Give necessary explanation wherever needed.

b) Explain Close Ratio and Retention Ratio giving suitable examples.

c) Discuss the factors that affect an insured's propensity to purchase a new product or renew an existing product

Q.6. Answer **any two** of the following: 6 each

a) Discuss three different ways in which the initial premium and premium adjustments can be structured in Retrospective Rating.

b) An insurance company writes a book of business that contains several classes of policyholders. You are given:

i) The average claim frequency for a policyholder over the entire book is 0.425.

ii) The variance of the hypothetical means is 0.370.

iii) The expected value of the process variance is 1.793.

One class of policyholders is selected at random from the book. Nine policyholders are selected at random from this class and are observed to have produced a total of seven claims. Five additional policyholders are selected at random from the same class. Determine the Buhlmann credibility estimate for the total number of claims for these five policyholders.

c) Give a brief note on each of the four different categories of Underwriting Expenses.

Q.7. Answer **any two** of the following: 6 each

a) Given the following information

Projected Pure Premium including LAE = 300

Projected fixed UW expenses per exposure =25

Variable expense ratio = 25%

Target profit percentage = 10%

Calculate pure premium indicated Average Rate.

b) Given the following information

Projected ultimate loss & LAE Ratio = 65%

Projected Fixed expenses ratio = 6.5%

Variable expense Ratio = 25%

Target profit percentage = 10%

Calculate Loss Ratio indicated Rate Change.

c) Compare & Contrast Loss Ratio & Pure Premium Methods.

Q.8. Explain the concept of credibility in context of ratemaking. Explain various approaches for determining credibility of an estimate along with desirable qualities for the complement of credibility. 12

Q.9. Give suitable examples of key stakeholders to whom the ratemaking actuary communicates the effect of the expected rate change and explain the relevance of information while communicating to different key stakeholders 12

Q.10. Calculate Reported loss on 31/12/2013, 31/12/2014 and 31/12/2015 using 16

i) Calendar Year 2013 Aggregation

ii) Accident Year 2013 Aggregation

iii) Policy Year 2013 Aggregation

For the given claims transaction history:-

Policy Effective date	Date of Loss	Report Date	Transaction Date	Incremental Payment	Case Reserve
01/07/2013	01/11/2013	19/11/2013	19/11/2013	0	10000
			01/02/2014	1000	9000
			01/09/2014	7000	2500
			15/01/2015	3000	0
10/09/2013	14/02/2014	14/02/2014	14/02/2014	5000	10000
			01/11/2014	8000	4000
			01/03/2015	1000	0

End