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

A-3

May, 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) Briefly describe the two different sources of Profit for Insurance Companies.
b) Discuss on the assumption and mechanics of Chain Ladder Method
c) Discuss on Underwriting Expense Ratio
d) Explain the application of Harwayne's Method.

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

a) State the rating factors used in pricing a Personal Automobile Policy, Commercial Automobile Policy and a Household Policy
b) What are the additional considerations to arrive at the final office premium from risk premium? Explain briefly each of the component.
c) A company is considering to launch a new product. Who are the stakeholders involved in the process, explain the role of any two.
d) You are about to carry out the actuarial reserve valuation as at 31st March 2016, for a private motor book of business. Will underwriting year/quarter or accident year/quarter data be used by you? Discuss your selection.

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

a) Write a short note on territorial ratemaking.
b) When rating a personal household property worth INR 320 crores, what are the external data sources and what information from these can be used for rating?
c) Explain what is a GLM, specify the mathematical structure of a GLM?
d) What are the factors affecting an insured's propensity to renew an existing health insurance product?

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

a) In the context of Premium Trend explain with examples how circumstances can cause changes in the average premium level depending on the characteristics of the policies written.
b) List out the principles involved in Rating Claims-Made Insurance Policies. (No detailed explanation is necessary)
c) Write Notes on Trending Expenses.

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

a) Describe the two spatial smoothing techniques used in pricing analysis.
b) Briefly explain the Operational Criteria for evaluating Rating variables.
c) Explain the parallelogram method.

Q.6. a) Demonstrate Lifetime Value Analysis by examining the profitability of insured over a long period of time, with suitable examples and give adequate explanations wherever necessary 8

b) Calculate the Proposed Base Rate based on the following input data: 4

1.	Current Average Premium	Rs.242.13
2.	Target percentage change in Average Premium :	3.25%
3.	Seed Base Rate	Rs.215.00
4.	Average Premium Assuming seed base rate	Rs.246.83
5.	Proposed fixed fee per policy	Rs.25

Write down the relevant formula used, clearly indicating the notations

Q.7. What are the four different methods of determining the complement credibility for excess rate making analyses and explain any two of them. 12

Q.8. Describe how will you compute the premium to insure the various risks associated with an Oil Refinary. Your answer should include a discussion on: 12
Risks, Benefits, Data, Approach to Pricing, Other Considerations.

Q.9. The actual loss costs (pure premium) for auto rating structure is as under: 12

	Urban	Rural	Total
Male	Rs. 650	Rs.300	Rs.528
Female	Rs.250	Rs.240	Rs.244
Total	Rs.497	Rs.267	Rs.400

The exposure distribution is as under

	Urban	Rural	Total
Male	Rs. 170	Rs.90	Rs.260
Female	Rs.105	Rs.110	Rs.215
Total	Rs.275	Rs.200	Rs.475

The base rate is assumed to be Rs.100

Gender has values with a rate relativity expressed as g_1 for males and g_2 for female.

Territory has values urban t_1 and rural t_2.

The base levels, relative to which all multiplicative indications will be

expressed, are female and rural (hence g_2= 1.00 and t_2 = 1.00).

Starting with seed values for gender, solve for the first values of g_1 and g_2 and solve for the new intermediate values t_1 and t_2.

Explain clearly the steps involved.

Q.10. a) What is meant by 'ILF'? 3

b) Why is 'censored data' not preferred by actuaries in pricing cedants? 3

c) You are given the following data for Altamount Insurance: 6

Size of loss (x) in INR	Reported Claims	Ground up reported loss in INR mn
$0 \leq x < 20{,}000$	3200	57.6
$20{,}000 \leq x < 50{,}000$	2700	118.8
$50{,}000 \leq x < 1{,}50{,}000$	1800	158.4
$1{,}50{,}000 \leq x < 3{,}00{,}000$	980	235.2
$3{,}00{,}000 \leq x < 7{,}00{,}000$	425	292.4
$7{,}00{,}000 \leq x$	125	428.6

Calculate the Loss elimination ratio for the different loss limits.

d) Explain in steps how can the loss elimination ratios computed in previous step be used for pricing an excess of loss policy attaching at INR 500,000. What more information if any you would require to arrive at the final premium. 4

End