

# INSTITUTE AND FACULTY OF ACTUARIES

## EXAMINATION

23 September 2014 (pm)

### Subject SA3 – General Insurance Special Applications

*Time allowed: Three hours*

#### ***INSTRUCTIONS TO THE CANDIDATE***

1. *Enter all the candidate and examination details as requested on the front of your answer booklet.*
2. *You have 15 minutes at the start of the examination in which to read the questions. You are strongly encouraged to use this time for reading only, but notes may be made. You then have three hours to complete the paper.*
3. *You must not start writing your answers in the booklet until instructed to do so by the supervisor.*
4. *Mark allocations are shown in brackets.*
5. *Attempt both questions, beginning your answer to each question on a new page.*
6. *Candidates should show calculations where this is appropriate.*

#### ***AT THE END OF THE EXAMINATION***

*Hand in BOTH your answer booklet, with any additional sheets firmly attached, and this question paper.*

<p><i>In addition to this paper you should have available the 2002 edition of the Formulae and Tables and your own electronic calculator from the approved list.</i></p>
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### **SA3 amended exam paper September 2014**

This version of the SA3 September 2014 examination paper contains an amendment to the one presented to students on the day of the examination session.

The amendment relates to Question 2. The numbering of the requirement parts within this question were incorrectly ordered. However, this incorrect numbering did not impact on the substance of any parts of this question, the expected answers or the allocated marks. The marking team for this paper have been fully informed of the error and students can be assured that the circumstances will be taken into account when scripts are marked and when the Board of Examiners meet to approve the results.

- 1 In the country of Motorland, owners of motor vehicles must purchase third party bodily injury insurance with standardised terms and conditions. It is optional to purchase motor property damage insurance. Motorists can choose to purchase bodily injury and property damage cover from the same insurer or different insurers.

Premium rates for both motor bodily injury and property damage insurance are unregulated at present, and insurers set premium rates based on a wide range of rating factors.

The Minister for Equality has proposed that each insurer should quote a single premium rate for motor bodily injury insurance, and that this premium applies to each policyholder irrespective of possible claim costs.

Insurers who wish to underwrite motor insurance would not be allowed to decline any individual motorists, and so must insure anyone who can pay the premium. There is no proposal to regulate motor property damage insurance, because this cover is optional.

The Minister says:

*“Some people can’t afford insurance and that’s just not fair. My proposal will mean that insuring a car will be affordable for all.*

*People sometimes drive without insurance if they can’t afford the premium. In future, the roads will be safer because everyone will be insured.*

*With one price for everyone, doing business will be much easier for insurers, so the insurer should also be delighted by this proposal. Insurers can still decide what rate to charge, but must offer that same rate to each customer.”*

- (i) Discuss whether the proposal is likely to mean “insuring a car will be affordable for all”. [8]
- (ii) Discuss whether the roads are likely to be “safer because everyone will be insured”. [3]

A leading insurer has stated that, under this proposal, premiums will no longer be sufficient to cover claim costs, and insurers will therefore become insolvent.

- (iii) Discuss whether this statement is correct. [18]

The Minister has announced an alternative proposal. There will be limits on the maximum and minimum rates that each insurer can charge, but insurers will be free to charge any premium within that range according to their risk assessment, and to use any rating factors that they wish.

The maximum and minimum rates for each insurer are calculated as follows:

- $P$  is the average premium that the insurer expects to charge, based on the expected customer mix and the proposed rating factors.
- The minimum premium the insurer may charge is  $0.75P$ .

- The maximum premium the insurer may charge is  $5000 + 0.3(P - 1000)$ .

Across all insurers, the average annual premium for motor bodily injury insurance in Motorland is \$1,000. Around 20% of motorists pay less than \$500 per year, with 5% paying more than \$6,000.

Speedysure is a small motor insurer specialising in young drivers of high performance vehicles. The average annual premium currently being charged by the company is \$5,000. Speedysure is considering how it might change its pricing strategy if this new proposal is implemented.

Speedysure is considering rating structures with average premiums ( $P$ ) of either (a) \$800, (b) \$1,000, (c) \$1,200 or (d) \$5,000.

- (iv) Calculate the minimum and maximum premiums that Speedysure could charge for each of the four values of  $P$ . [2]

Assume that Speedysure sets its average premium rate at \$1,000.

- (v) (a) Give an example of a driver who is likely to pay the *minimum* premium rate.
- (b) State with a reason whether insuring this driver is likely to be profitable.
- (c) Give an example of a driver who is likely to pay the *maximum* premium rate.
- (d) State with a reason whether insuring this driver is likely to be profitable. [4]

- (vi) Speedysure is now considering two average premium rates, (a) \$800 and (d) \$5,000. For each option under consideration, discuss whether Speedysure is likely to be profitable. [21]

[Total 56]

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- (i) (a) Define a P&I club.
- (b) Explain the role P&I clubs and the International Group of P&I clubs play in the international insurance market. [6]

P&I clubs have the ability to make supplementary calls to members to restore pool capital following material losses passed to the pool, which forms an important source of capital. Supplementary calls that have been notified to members but not yet paid are recognised as an asset on the club's balance sheet. Future supplementary calls represent the ability of P&I clubs to make calls in the future in response to unforeseen events.

- (ii) Outline the criteria used to allocate eligible own funds to tiers under Solvency II. [10]
- (iii) Discuss the features of both supplementary calls and future supplementary calls for P&I clubs and suggest an appropriate tier for each. [15]

A small mutual insurance company, Red Fishing Boats, wants to reduce its overall net exposure and is considering two potential options.

Option 1: Purchasing a £5m xs £5m risk excess of loss policy.

Option 2: Joining a large mutual pooling arrangement for insurers, the members of which provide cover for 90% of all fishing boats globally. Members of the pool retain the first £5m of any insured claim in their portfolio and share all costs above that level. Under the pool's rules, Red Fishing Boats would have to contribute 1% of all such pooled losses.

- (iv) Calculate the net loss to Red Fishing Boats under both options in each of the following three scenarios.
- Scenario 1: Red Fishing Boats suffers a loss of £6m
  - Scenario 2: Red Fishing Boats suffers a loss of £15m
  - Scenario 3: Blue Fishing Boats (another member of the mutual pooling arrangement) suffers a loss of £10m
- [2]

Last year, members of this pool suffered a higher than usual number of individual losses in excess of £5m. The pool has therefore decided to purchase external reinsurance for the pooled losses. It is proposed to share the reinsurance premium costs in proportion to members' gross written premiums on their own portfolios.

- (v) List the advantages and disadvantages of this proposal for sharing costs. [4]

A director of Red Fishing Boats is reluctant to join the mutual pooling arrangement (Option 2) claiming that the members have to pay twice for poor underwriting in other companies: firstly for the pooled loss and secondly in increased reinsurance premiums. Furthermore since Red Fishing Boats is a mutual, its members are already pooling losses; therefore there is no additional benefit to being part of the pool.

(vi) Discuss the validity of the director's comments.

[7]

[Total 44]

**END OF PAPER**