

University of Waterloo
Final Examination
ACTSC 895 – WINTER 2021

Course abbreviation and number	ACTSC 895
Course Title	Actuarial Communications
Instructor	Diana Skrzydlo
Date of Exam	Tuesday April 20, 2021
Time Period	9:00-11.30 am EDT
Duration of Exam	2.5 hours
Number of Pages (including front cover)	4

Question	Maximum
1	40
2	10
3	10
4	10
Total	70

Instructions

- You should compile all your written answers into one Word or pdf document.
- When you are finished, submit the file to the Dropbox on Learn.
- If you need any addresses or names, feel free to make them up.
- Good luck!

1. For this question you should use the report “Defined Contribution Plans, Emergency Funds and COVID-19: Challenges for Plan Sponsors and Participants” previously circulated. You may have it open on your computer.

You are a pension consulting actuary, and most of your clients are Canadian employers who sponsor Defined Contribution pension plans for their employees. They have asked you for advice about what, if any, changes they should be making to their strategy at this time.

Write an **executive summary** (approx 350-450 words) of the report, including your recommendations for your clients.

[40 Marks: 20 for content, 20 for grammar/flow/readability]

2. One of your friends’ parents, who has moved their business into their home due to the shutdown, has sent you the following email:

Hi,

As you know I’ve had to bring some equipment home from work and set up a home office to keep my business going.

My home insurance company sent me an email saying I should consider getting additional “home-based business” coverage, which they said would cover business equipment/tools, loss of cash, business continuation expenses, and business liability.

I know you work for an insurance company so can you tell me a bit more about how this works? Wouldn’t my home insurance just cover this anyway? Do you think I should take this policy?

Thanks for any help you can provide!

You know the equipment they use for their business is quite expensive and specialized, and they need to ship the physical product to their clients somehow.

Write an **email** reply (150-250 words), explaining:

- some ways home-based business would be helpful for things not covered by home insurance
- the answers to their questions/concerns
- whether you think they should opt for this policy

Keep in mind that they are not a technical expert, so avoid jargon and explain things in plain language.

[10 Marks]

3. Diana's next-door neighbours, Lara and Julian Dove, were on vacation in Australia with their three young children when COVID-19 hit in 2020. They flew there on March 8, and had return flights booked for March 29. On March 14, the Government of Canada advised Canadians to return home. Their flights were not cancelled right away, and it was extremely costly to switch to earlier flights, so they didn't rebook. A week later, however, their flights home were cancelled by the airline. They were able to re-book very expensive last-minute flights home on March 24, and needed to stay quarantined once arriving home for 14 days. Luckily, they have travel insurance!

All together, their estimated costs were:

- 5 x \$3,000 in last-minute flights
- \$1000 in other transportation costs (hotel for layover, shuttle home, etc)
- 1 week of lost income for Julian (since quarantine lasted a week after he was supposed to be finished vacation)

They have submitted their claim estimates, and you have determined their insurance coverage is as follows:

- Because the trip was booked and started before any travel advisory was in place, they are fully covered for all travel-related costs
- Since the flight was cancelled by the airline, the difference between the fares is covered (original tickets were \$1000 each)
- Lost income is not covered but Julian may be eligible for benefits from EI or other new government programs (CERB)
- The deductible on the policy is \$500 (total, not per traveller)

Write a **business letter** of around 150-250 words to the Dove family, making sure to:

- explain what their policy does and does not cover
- state the total amount that would be payable
- have appropriate tone and format for the purpose

[10 Marks]

4. Choose any five (5) of the following questions, taken from the SOA presentations and final projects, and answer them in 1 or 2 sentences. You may choose your own project/topic as one of the 5 if you wish. **[2 Marks Each]**

- (a) Describe how UBI (usage-based insurance) can be used to explain the differences in auto insurance claims rates between genders.
- (b) Discuss how companies are changing their underwriting processes with respect to genetic testing.
- (c) Describe the relationship between credit score and auto insurance claims, and discuss concerns with using it as a rating factor.
- (d) Discuss the impact that climate change may have on the insurance industry, and how it can be modelled.
- (e) Describe some of the challenges and opportunities in using Machine Learning to analyze claims data.
- (f) Briefly describe key differences between the health care system in the US and Canada.
- (g) Outline the concerns with the interconnectedness of reinsurers and describe some ways that regulation could to reduce the impact.
- (h) Describe the differences between different generations when it comes to financial preparedness for retirement.
- (i) What trends in e-cigarettes (vaping) do we see, and what are the risks and potential impact?
- (j) Describe how dependence between lifetimes of couples can be modelled to capture increased mortality after a spouse dies.
- (k) How are trends in mortality from diseases different by socioeconomic class, and what can be done to reduce the gap?
- (l) Explain how and why the mortality characteristics of post-level term policyholders (who continue their policies after their term insurance ends) are so different from those during the term of the policy.
- (m) Describe the impact that adding a ρ -hedge against interest rates would have on the loss for a VA (variable annuity) with a guarantee.
- (n) Describe some regulations that can protect consumers from making biased financial decisions.
- (o) What are some factors regulators should look at when trying to prevent insurer insolvencies?
- (p) When designing a social disability insurance program, what are the consequences if benefits are cut off if a person earns above a certain threshold?
- (q) Describe some of the challenges facing under-funded pension plans, and how they can manage their risk.
- (r) What are the key goals and features of the new IFRS17 financial reporting standards?