

THE UNIVERSITY OF WESTERN ONTARIO
Actuarial Science 1021A
Test 2- 1 hour
March 19, 2018

Name (print clearly):

MASTER

STUDENT ID (print clearly):

INSTRUCTIONS

1. This test is worth a total of 55 marks. There are a total of 8 pages including this cover page. Make sure you have a complete copy of the test.
2. There are a total of 5 questions. Use the detailed marking breakdown as a rough guideline for time spent on each question and question part.
3. Please answer your questions on your paper in the space provided.
4. You may use reverse pages if necessary but please indicate that you are doing so by putting PTO on the given question page.
5. Calculators are permitted.
6. Please use a pen (although you may use pencil for questions regarding calculations).
7. Values provided for this test are included on page 8. You may detach this page from your test.

Question	Mark
1. 8 marks	
2. 20 marks	
3. 10 marks	
4. 7 marks	
5. 10 marks	
Total: 55 marks	

GOOD LUCK!

Question 1 (8 marks)

Post 1977.

- (a) (5 marks) Alex is married, and was 67 years old when he applied for his OAS pension. At the time of application, he had lived in Canada for the last 32 years. His total reported income is \$20,000. His spouse also had a total report income of \$15,000 and she is 62 years of age. Working with the 2018 maximum benefit amounts provided (see page 8), determine the amount of 2018 GIS benefit that each of them will receive?

OAS + income

$$\text{OAS pension} = \$36.91 = \frac{32}{40} (586.66) (1 + .006(24))$$

late retirement 2x12.

CPP: early 0.6 late 0.7

OAS: X 0.6

$$\text{Income (Alex) excluding OAS} = 13,557.07 = 20,000 - 12(536.91)$$

OAS: 65 count

not eligible.

Spouse - OAS N/A (only 62)

Alex spouse.

$$\text{TOTAL Income for couple (excluding OAS)} = 28,557.07 = 13,557.07 + 15,000$$

less Annual eld'n (=4)

7,139.27

Month "

594.94

So Alex receives a GIS benefit of $(876.23 - 594.94) = 281.29$

Spouse " no GIS benefit

max GIS

- (b) (3 marks) For each of the OAS pension and the Spousal Allowance Benefits briefly comment on (i) taxation of benefits, (ii) continuation of benefit payments when an individual moves to a different country and (iii) indexing of benefits.

	OAS pension	Spousal Allowance
(i) Taxation of Benefits	- fully taxable	- not taxable
(ii) Continuation of benefits when move away from Canada	if lived in Canada for 32 years full limit on payments made → if 1 year (less for 2 years get OAS for 1 month then 6 months more months (may reduce to 6 months back to Canada)	payable for at most 6 months after move.
(iii) Benefit indexing	Quarterly Indexing (CPI)	Quarterly Indexing (CPI)

Question 2 (20 marks)

- (a) (2 marks) Lawrence Perkins works for London City Hall as a programmer. In 2018 he is expected to earn 85,000. How much will Lawrence contribute to the CPP this year?

$$\left(\frac{.099}{2}\right) (55,900 - 3500) = 2,593.80$$

↑
Capred

- (b) (2 marks) Samuel Haustra retired in this past January when he turned 62. His Average earnings ratio was 82%. What is his estimated CPP Retirement Pension Benefit (RPB) payment?

$$(0.82) (\underline{1,134.17}) \left(1 - \overset{0.784}{.006(36)}\right) = 729.14 \text{ monthly}$$

- (c) (2 marks) Jane Stanley is currently receiving her CPP Retirement Pension Benefit. She is now age 67 and still working at job that pays her \$60,000 yearly. What is her 2018 CPP monthly Post Retirement Pension payment amount?

2.5% max. late racial.

$$(.025) (1,134.17) \left(1 + \frac{(.007)(24)}{1165}\right) = 33.12 \text{ per month}$$

US 125 contribution to \$.

- (d) (5 marks) Jennifer Jones is 55 and passed away suddenly earlier this month. Her average earnings ratio is calculated to be 85%. Her husband Bill is 50 and they have two sons aged 12 and 15. Describe the respective survivor benefits that will be paid out. Also, calculate the amount of survivor pension that will be paid to Bill.

3 benefits: (i) LSDP = 2500 Max (6 x mth CPP RPB calc as if retired at death)
not required to mention

(ii) Each son gets monthly pension of 244.64 till they turn 18 (or 25 if still in school)
 Dependent CPP Pmt.

should refer to these

(iii) Survivor Pension to Bill (SP)

$$SP = \left(\frac{361.52}{1165}\right) (.85) (1,134.17) + 189.31$$

3/8 ratio Max CPP Survivor Benefit

$$= 550.83$$

Question 2 (continued)

(e) (5 marks)

- (i) (2 marks) Use the information below to determine the 2016 earnings related portion of the CPP Disability benefit paid out to Samantha, who became disabled on April 1, 2016.

Contributory period (from age 18 to date of claim) : 25 years
 Years that can be dropped out : 6 years
 Total Adjusted Pensionable Earnings : \$482,000

$$\left(\frac{482,000}{19} \right) (0.25) (0.75) = 4756.58 \text{ (annual amount)}$$

Average. or 396.38 monthly (earnings related portion)

- (ii) (1 mark) With regards to the 6 years that Samantha could drop out in his pension benefit calculation, what drop-out considerations are reflected? Justify your answer.

$(.17)(25) = 4.2$ but 6 yrs dropped out so
 either some years she was disabled or
 stayed home to raise kids

- (iii) (2 mark) When will Samantha's monthly disability payments start? When will they stop?

• 4 mths after disabled - START 4 mths after
 • earlier of {recovery, death, turns 65} - END earlier of {recovery, death}

- (f) (2 marks) You are given that the Yearly Maximum Pensionable Earnings (YMPE) for the years 2014 through to and including 2018 are; 52,500, 53,600, 54,900, 55,300 and 55,900 respectively. If Broderick's total earned income in 2018 is \$42,500, determine his 2018 Adjustable Pensionable Earnings.

$$5 \text{ yr avg YMPE} = 54,440 = \frac{1}{5} (52,500 + 53,600 + 54,900 + 55,300 + 55,900)$$

$$2018 \text{ APE} = \left(\frac{42,500}{55,900} \right) (54,440) = 41,389.98$$

- (g) (2 marks) Since the 2016 CPP Expansion Plans were announced in 2016, there have been additional changes made to the CPP. What are 2 changes being that will take effect in 2019?

2 of

- removing age restriction on survivor benefit (i.e. those <35)
- LSDP = 2500 for all deaths
- "drop in provisions" for years home with kids < 7.
- Disability benefit calc change (70% age by earnings)

also, accepted CPP change from 2016 - eg. contrib rate increase

Question 3 (10 marks). With regards to Long Term Care (LTC)

(a) (6 marks) Briefly describe each of the three types of Long Term Care.

- majority of needs {
- Personal care
 - Supervisory care
- Skilled / Professional Care - therapists, nurses, etc (medical needs (e.g. diabetes) no)
- help with ADLs (can be in home or in nursing home)
 - e.g. for those with cognitive impairments Dementia / Alzheimers

skilled care
personal care
supervisory care

- nurses. 这个人是不行的。
- help with ADLs: 老年症。
- with cognitive impairments.

这个人是不行的。

(b) (2 marks) Provide 4 examples of Long Term Care Insurance Policy exclusions,

4 of

- addictions
- suicide attempts
- pre-existing conditions
- mental nervous disorders (other than dementia / Alzheimers)
- illness / injury due to war
- govt coverage.

(c) (2 marks) Explain what is meant by the term benefit triggers and why benefit triggers are an important part of a Long Term Care Insurance Policy. Provide an example.

→ these triggers describe how + when benefits are paid.

→ ADL - most common trigger

- e.g. if unable to perform 2 of 6 ADLs

→ cognitive test - if fail a test (cognitive impairment) this would be a trigger

Question 4 (7 marks)

With regards to provincial government health plans in Canada

- (a) (1 marks) What is the primary role of the Canada Health Care Act?

set criteria for provinces to be eligible for
unrestricted funding
protect health of residence
"protect/promote/restore health (no barriers to healthcare)"

- (b) (1 marks) How does British Columbia finance their provincial health plan (OHIP) costs?

- Monthly Premiums (amounts differ by single
couple
family)

- (c) (2 marks) What are the eligibility requirements to be covered by the Ontario Health Insurance Program (OHIP)?

→ live in Ont 153+ days/year (primary residence is in Ont.)
→ Can Citizen/immigrant status
→ lived in Ont at least 3 months

- (d) (3 marks) A self-employed individual who has lived in Ontario all his life is seriously ill and is hospitalized for 5 days and then spends time at home recovering for a few weeks. He has an Individual Health Insurance Policy. Outline potential expenses that would be covered by his Health Insurance Policy and those that would be covered by OHIP.

OHIP

- ward accommodation
- drugs/supplies/treatment while in hospital ("medically necessary")

Ind'l Health Ins

- room upgrade
- Drugs needed after discharged from hospital
- Private Duty Nursing
- ~~for~~ therapist at home (or outside hospital)

Question 5 (10 marks)

- (a) (4 marks) Increased costs of Extended Health care Plans (EHC) is an area of concern for any employer. Briefly describe each of the key drivers of the costs of EHC plans?

→ Health Ins cutbacks (can't cost shifting)
• shorter hospital stays ⇒ more costs to EHC

→ Health Issues related to obesity

→ rising costs of Drugs (80% plan costs covered drugs)

→ changing demographics of workforce (greater % are older - more EHC needs)

- (b) (3 mark) In class we discussed various Extended Health Care (EHC) cost containment strategies. Provide three examples of cost containment strategies used in Western's faculty EHC Care Benefits and Dental Plan.

Dental - no orthodontics
- 80% coins expenses not capped
- 9 with checkups (vs 6)
- ↑ cost sharing
- HCSA

Medical - lowest cost drug
- limited lifestyle coverage
- paramedic costs (not considered in caps), limit per visit

- (c) (1 mark) William is a faculty member the purchases some prescription drugs that are covered under his Western faculty extended health care benefits plan. The drugs cost \$200 and there is an \$8.00 dispensing fee. Calculate William's out of pocket expenses for these drugs? You are given the dispensing fee covered is capped at \$6.11.

$$\frac{(.15)(200)}{(1-.15)} = 30 + 1.89 = \underline{\underline{31.89}}$$

- (d) (2 marks) Briefly describe the key provisions of Western University's Faculty Dental Plan.

85% coins to Basic + Supp (most services)
with max cap on expenses that are 85% coinsured
(Δ limit - single vs family)

- Restorative - 80% coins
- no orthodontics
- can use HCSA to cover Dental costs (not covered above)

2018 Values provided: (you can gently detach this page)

Maximum OAS monthly benefit = \$586.66; minimum income for clawback = \$75,910

Maximum GIS benefit for single, divorced or separated OAS pensioner = 876.23 (income for full reduction is 17,784)

Maximum GIS benefit for OAS pensioner with a partner not eligible for OAS or spousal allowance = 876.23 (combined income for full reduction is 42,684)

Maximum GIS benefit where both partners are OAS pensioners = 527.48 for each partner (combined income for full reduction is \$23,520)

Maximum monthly spouses allowance = \$1114.14 (income for full reduction = \$31,968)

Maximum monthly survivor allowance = \$1328.08 (income for full reduction = \$23,256)

Maximum CPP monthly retirement benefit = \$1,134.17

CPP contribution rate (ee + er) = 9.90%

YMPE = 55,900

YBE = 3,500

Flat amount for CPP disability benefit = \$485.20

Flat amount for CPP survivor benefit (younger than 65) = \$189.31

Dependent CPP flat amount benefit = \$244.64