SOCIETY OF ACTUARIES®

Exam RETFRC

Funding & Regulation Exam - Canada

Date: Thursday, October 27, 2022

INSTRUCTIONS TO CANDIDATES

General Instructions

1. This examination has 9 questions numbered 1 through 9 with a total of 100 points.

   The points for each question are indicated at the beginning of the question.

2. While every attempt is made to avoid defective questions, sometimes they do occur. If you believe a question is defective, the supervisor or proctor cannot give you any guidance beyond the instructions provided in this document.

Written-Answer Instructions

1. Each question part or subpart should be answered either in the Word document or the Excel file as directed. Graders will only look at work in the indicated file.

   a) In the Word document, answers should be entered in the box marked ANSWER. The box will expand as lines of text are added. There is no need to use special characters or subscripts (though they may be used). For example, β_1 can be typed as beta_1 (and ^ used to indicate a superscript).

   b) In the Excel document formulas should be entered. Performing calculations on scratch paper or with a calculator and then entering the answer in the cell will not earn full credit. Formatting of cells or rounding is not required for credit.

2. The answer should be confined to the question as set.

3. Prior to uploading your Word and Excel files, each file should be saved and renamed with your five-digit candidate number in the filename.

4. The Word and Excel files that contain your answers must be uploaded before the five-minute upload period expires.

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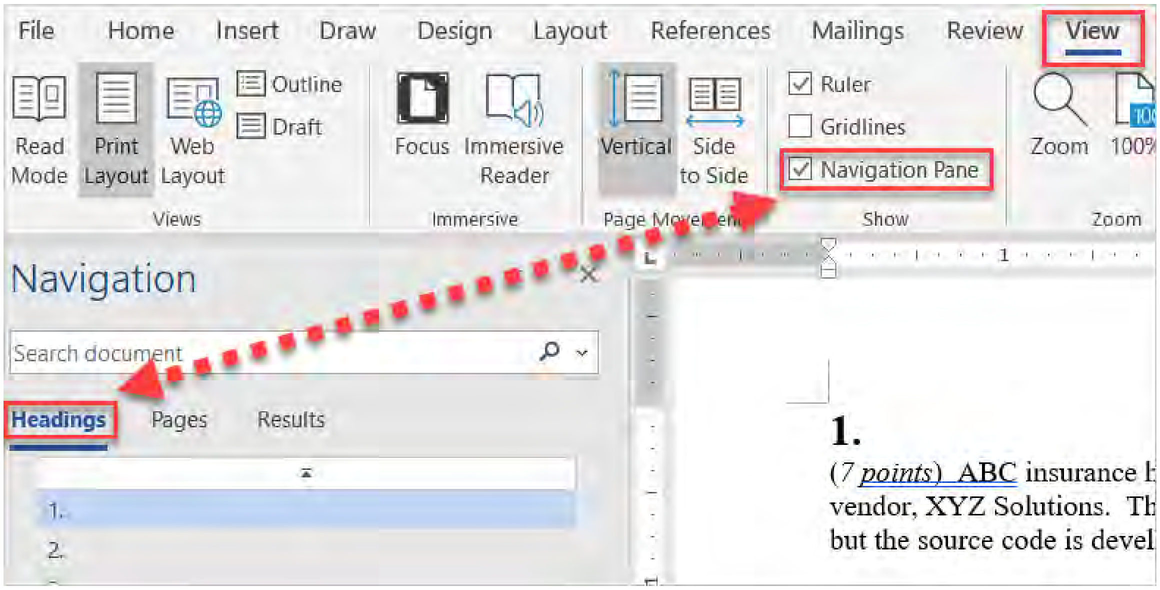
Schaumburg, IL 60173

Navigation Instructions

Open the Navigation Pane to jump to questions.

Press Ctrl+F, or click View > Navigation Pane:



1.

(*7 points*)

You are preparing for an annuity purchase for a pension plan. Your firm is not the third-party plan administrator of the plan. The plan is comprised of only retirees and deferred vested members.

You are given:

Normal form of pension:	Lifetime pension guaranteed for 5 years (G5), if single 60% joint and survivor pension (J&S 60%), if married, on an actuarially equivalent basis
Optional forms of pension:	Provided on an actuarially equivalent basis
Early retirement:	Members (including deferred members) can retire as early as age 55 with a 1/4% per month reduction from Earliest Unreduced Retirement Date (EURD)

1. Continued

Participant Data

Schedule A- Retirees

ID	Status	Date of birth (m/d/yyyy)	Sex	Spouse date of birth	Spouse sex	Date of retirement	Form of pension payable	Monthly pension amount
1	Pensioner	3/3/1930	M	2/5/1935	F	4/1/1995	J&S 100%	700
2	Pensioner	5/2/1955	M	3/9/1948	F	6/1/2017	J&S 60%	3,500
3	Survivor	4/2/1925	F	n/a	n/a	4/1/1999	Life only	800
4	Survivor	12/30/1945	M	n/a	F	8/1/2017	G5	4,200
5	Survivor	12/15/1954	F	n/a	n/a	4/1/2010	J&S 75%	1,500
6	Pensioner	7/17/1958	F	n/a	M	11/1/2014	G10	2,200
7	Pensioner	6/19/1961	M	3/15/1966	n/a	10/1/2017	J&S 100%	2,800
8	Pensioner	3/1/1940	M	4/16/1942	F	7/1/1998	J&S 75%	1,500
9	Pensioner	7/2/1962	M	5/18/1966	F	12/1/2027	J&S 75%	1,600
10	Pensioner	8/3/1958	M	12/19/1949	F	1/1/2016	J&S 100%	2,000
11	Pensioner	9/4/1961	M	n/a	F	2/1/2017	G10	2,100
12	Pensioner	1/5/1954	M	6/15/1951	F	6/1/2011	J&S 100%	2,000
13	Pensioner	2/9/1960	M	3/17/1952	F	3/1/2016	J&S 60%	2,700
14	Pensioner	3/9/1957	F	n/a	M	4/1/2016	G10	5,900
15	Pensioner	4/10/1948	F	n/a	M	5/1/2013	G5	3,500
16	Pensioner	5/11/1943	M	9/2/1943	F	6/1/2008	J&S 100%	3,400
17	Pensioner	5/15/1955	M	12/3/1953	F	6/1/2017	J&S 100%	2,800
18	Survivor	5/15/1948	M	n/a	n/a	7/1/2009	Life only	3,100
19	Pensioner	4/16/1948	F	5/5/1945	M	5/1/2012	J&S 60%	1,700
20	Pensioner	9/18/1947	M	7/9/1944	F	5/1/2007	J&S 60%	500
21	Survivor	8/19/1948	F	n/a	n/a	12/1/2005	Life only	300
22	Pensioner	2/22/1949	F	9/10/1947	M	10/1/2007	J&S 60%	4,000
23	Survivor	3/22/1950	M	n/a	n/a	4/1/2002	Life only	3,800
24	Pensioner	4/23/1951	M	1/2/1955	F	5/1/2013	J&S 100%	3,700
25	Pensioner	12/24/1952	M	1/2/1930	F	1/1/2013	J&S 75%	3,500
26	Beneficiary	12/26/1953	M	n/a	F	4/1/2006	Life only	1,100
27	Pensioner	5/29/1954	M	5/23/1953	F	6/1/2014	J&S 60%	18,000
28	Survivor	7/30/1955	M	n/a	n/a	7/1/2007	Life only	1,000
29	Survivor	8/30/1956	F	n/a	n/a	8/1/2010	Life only	2,200
30	Pensioner	10/30/1957	M	n/a	F	11/1/2016	G15	2,300

1. Continued

Schedule B - Deferred Vested Members

ID	Status	Date of birth	Sex	EURD	Normal retirement date (NRD)	Normal form of pension	Monthly pension amount at NRD
31	Deferred	2/21/1960	M	3/1/2022	3/1/2025	G5	1,000
32	Deferred	12/23/1975	M	1/1/2037	1/1/2041	G5	80
33	Deferred	2/3/1980	M	3/1/2040	3/1/2045	G5	2,200
34	Deferred	4/30/1970	M	5/1/2030	5/1/2025	G5	3,300
35	Deferred	7/7/1962	M	8/1/2020	8/1/2027	G5	1,200
36	Deferred	8/8/1982	F	9/1/2045	9/1/2047	G5	900
37	Deferred	10/10/1977	M	11/1/2042	11/1/2042	G5	1,400
38	Deferred	10/28/1978	M	11/1/2023	11/1/2043	G5	1,700
39	Deferred	11/29/1949	F	12/1/2011	12/1/2014	G5	1,800
40	Deferred	2/4/1982	M	3/1/2047	3/1/2047	G5	2,100

(a) (*3 points*) Identify the data quality issues.

The response for this part is to be provided in the Excel spreadsheet.

(b) (*2 points*) Recommend a detailed course of action to address the data quality issues identified in (a).

ANSWER:

(c) (*2 points*) Recommend a course of action to potentially reduce the annuity purchase premium.

ANSWER:

2.
(*6 points*)

(a) (*4 points*) Describe the considerations for adjusting the mortality assumption for a going concern valuation to reflect pension plan membership characteristics.

ANSWER:

(b) (*2 points*) Describe possible approaches for reflecting a plausible adverse scenario for the longevity risk of a pension plan.

ANSWER:

3.

(*35 points*) Your client sponsors a contributory defined benefit pension plan registered in Ontario.

Plan Provisions:

Retirement benefit:	2.00% of Final 3-year Average Earnings multiplied by years of service
Member contribution requirements:	5.0% of previous year earnings, contributed at the beginning of the year. Assume employee contribution balances would not trigger the 50% excess contribution rule.
Normal retirement age (NRA):	Age 65
Earliest retirement age:	Age 55
Unreduced early retirement age (UERA):	Age 62 with 20 years of service
Early retirement reduction:	*With 20 or more years of service:* 2% per year prior to age 65 *Otherwise:* Actuarial equivalent to pension deferred to NRA
Termination benefits:	Pension deferred to NRA Early commencement with actuarial equivalent benefit
Normal form of pension:	Life guaranteed for 5 years
Pre-retirement cost of living adjustments:	None
Post-retirement cost of living adjustments:	Pensions in payment are increased annually at 100% of CPI capped at 4%

3. Continued

The following information is as at December 31, 2021:

Actuarial Assumptions and Methods:

Going concern assumptions:

<table>
<tr><td>Discount rate:</td><td>5.00%</td><td>(per year)</td></tr>
<tr><td>Inflation:</td><td>2.00%</td><td>(per year)</td></tr>
<tr><td>Salary increases:</td><td>3.50%</td><td>(per year)</td></tr>
<tr><td>Explicit expense allowance for administrative expenses:</td><td colspan="2">$50,000</td></tr>
<tr><td>Pre-retirement mortality:</td><td colspan="2">None</td></tr>
<tr><td>Actuarial Cost Method:</td><td colspan="2">Projected Unit Credit, prorated on service</td></tr>
<tr><td rowspan="3">Retirement age (actives):</td><td>Age</td><td>Rate per year</td></tr>
<tr><td>62</td><td>60.0%</td></tr>
<tr><td>65</td><td>100.0%</td></tr>
<tr><td>Retirement age (deferred):</td><td colspan="2">Assume retirement at NRA</td></tr>
<tr><td rowspan="3">Termination rates:</td><td>Age</td><td>Rate per year</td></tr>
<tr><td>under age 45</td><td>5.0%</td></tr>
<tr><td>45 and over</td><td>0.0%</td></tr>
<tr><td>Form of benefit elected:</td><td colspan="2">100% of members elect to receive an immediate or deferred pension from the plan</td></tr>
<tr><td>Termination Assumption (from active status):</td><td colspan="2">Assume 100% of terminations are involuntary</td></tr>
<tr><td>Assets:</td><td colspan="2">Market Value of assets</td></tr>
</table>

3. Continued

Information for calculation of the provision for adverse deviations (PfAD):

Plan Type (Closed):	5.00%
Non-Fixed Income Percentage is 60%. Related PfAD Component:	7.00%
Benchmark discount rate (BDR):	5.90%

Solvency and Hypothetical Wind-up assumptions:

Solvency Basis	Solvency excludes indexation
Form of benefit settlement elected by member	
- Active and Deferred Members:	100% elect lump sum
- Pensioners:	100% annuity purchase
Basis for benefits assumed to be settled through a lump sum	
- Discount rate:	2.30% for 10 years, 3.40% thereafter
- Inflation rate:	1.50% for 10 years, 2.10% thereafter
Basis for benefits assumed to be settled through the purchase of an annuity	
- Discount rate:	2.70%
- Inflation rate:	2.20%
Termination Expenses:	$100,000
Retirement age:	In accordance with Standards of Practice

Amortization Schedules from previous valuation:

Type	Monthly Amortization Payment	Date Established	Start Date	Date of Last Payment
GC One	5,500	12/31/2020	1/1/2021	12/31/2021
GC Two	750	12/31/2020	1/1/2022	1/1/2032
Solvency One	1,000	12/31/2017	1/1/2018	12/31/2022
Solvency Two	2,000	12/31/2020	1/1/2022	12/31/2026

3. Continued

Membership information:

Active Members:	**ID1**	**ID2**
Age:	43	60
Earnings for 2019:	49,000	78,000
Earnings for 2020:	50,000	78,000
Earnings for 2021:	65,000	83,000
Years of service:	12.0	5.0
Status:	Full-time	Full-time

Deferred Members:	**ID3**	**ID4**
Age:	58	35
Termination Type:	Voluntary	Voluntary
Annual deferred pension:	25,000	10,000

Pensioners:	**ID5**	**ID6**
Age:	72	68
Spouse's age:	70	n/a
Retirement Date:	1/1/2012	1/1/2015
January 1, 2022 Annual Pension:	50,000	36,000
Form of pension:	J&S60%	Life guaranteed for 5 years

Asset Information:

Market value of assets at December 31, 2021: $1,287,780

There are no in-transit amounts as at December 31, 2021 or December 31, 2022.

Annuity factors:

[Provided in Excel]

3. Continued

You are asked to perform the actuarial valuation as at December 31, 2021.

(a) (*8 points*) Calculate the funded status of the plan on a going concern basis.

The response for this part is to be provided in the Excel spreadsheet.

(b) (*6 points*) Calculate the funded status of the plan on a solvency basis and on a hypothetical wind-up basis.

The response for this part is to be provided in the Excel spreadsheet.

(c) (*6 points*) Calculate the minimum required and maximum permissible employer contributions for 2022 and the estimated minimum required employer contributions for 2023.

The response for this part is to be provided in the Excel spreadsheet.

3. Continued

The next valuation date is December 31, 2022 based on the information provided below:

Member ID	**Status at December 31, 2022**
ID1	Terminated June 30, 2022, Lump Sum Payout of $215,000 on December 31, 2022
ID2	Active
ID3	Deferred
ID4	Deferred
ID5	Pensioner deceased March 2022. Spouse received spousal pension effective April 1, 2022
ID6	Pensioner deceased June 2022.

Other Data Experience

	ID2
Earnings for 2022:	87,150
CPI for 2022:	6.10%

Going Concern Assumption Changes

Discount rate:	5.20% (per year)
Salary Scale:	3.75% (per year)
Benchmark discount rate (BDR):	6.00% (per year)

3. **Continued**

Asset information (in $)

December 31, 2021 market value:	**1,287,780**
Company Current Service Cost, Expense Allowance and PfAD	100,000
Company special payments	50,000
Member contributions	6,200
Pension paid	(53,000)
Lump sums paid	(215,000)
Administration expenses	(24,000)
Investment expenses	(12,000)
Investment income	75,000
Realized and unrealized gains (losses)	(300,000)
December 31, 2022 market value:	**914,980**

You are performing the valuation at December 31, 2022.

(d) (*4 points*) Calculate the funded status of the plan on a going concern basis.

The response for this part is to be provided in the Excel spreadsheet.

(e) (*11 points*) Calculate the sources of gain/(loss) of the going concern funded status from December 31, 2021 to December 31, 2022.

The response for this part is to be provided in the Excel spreadsheet.

4.

(*6 points*) You are given:

<u>Plan Provisions:</u>

Normal Retirement Benefit:	0.8% of 3-year Final Average Earnings (FAE3) below 3-year Average YMPE (AYMPE) plus 1.4% of FAE3 in excess of AYMPE multiplied by years of credited service up to a maximum of 35 years
Normal Retirement Age:	Age 65
Postponed retirement:	No service accrual. Pension is increased actuarially
Credited service accrual:	Prorated based on completed months

You are given the following member information as at December 31, 2021:

Member	Age at 12/31/2021	Credited Service Earned in 2021	Credited Service at 12/31/2021	Pensionable Earnings in 2021
1	28	1	1	70,000
2	58	1	35	280,000
3	41	1	10	130,000
4	59	1	9	75,000
5	65	1	23	92,000
6	36	1	4	115,000

4. **Continued**

You are also given the following information for the year 2022:

Member	Pensionable Earnings in 2022 (not annualized)	Status
1	35,000	Terminated on July 1, 2022 and elected a lump sum payment of $6,500
2	288,500	Worked full year
3	66,000	Terminated on July 1, 2022 and elected a deferred pension
4	68,750	Deceased December 1, 2022
5	93,000	Worked full year
6	87,000	Terminated on October 1, 2022 and transferred pension entitlement to Plan B under a Reciprocal Transfer Agreement (RTA). Plan B is less generous than Plan A. Under Plan A, the total pension credits equal $48,000. For the same years of service under Plan B, the total pension credits equal $42,000. The commuted value of the benefits under Plan A is $40,500 and the commuted value of the benefits under Plan B is $35,080; based on the RTA, $35,080 will be transferred to Plan B, and the excess commuted value of $5,420 will be paid to the employee.

Additional information:

Year	YMPE	Income Tax Act Maximum Defined Benefit Pension Limit
2021	61,600	3,245.56
2022	64,900	3,420.00

4. Continued

(a) (*1 point*) Calculate the 2021 Pension Adjustments for all members.

The response for this part is to be provided in the Excel spreadsheet.

(b) (*3 points*) Calculate the 2022 Pension Adjustments for all members.

The response for this part is to be provided in the Excel spreadsheet.

(c) (*2 points*) Calculate the Pension Adjustment Reversals for 2022.

The response for this part is to be provided in the Excel spreadsheet.

5.

(*12 points*) Compare and contrast the going concern and hypothetical wind-up valuations with respect to the following:

(i) Purpose of the valuation;

(ii) Valuation methods;

(iii) Economic assumptions; and

(iv) Demographic assumptions.

ANSWER:

6.

(*10 points*) Your client sponsors a non-contributory defined benefit pension plan.

You are given:

Plan Provisions:

Retirement benefit:	\$100 per month per year of service
Normal form of payment:	Life only, payable monthly in advance
Normal retirement age:	Age 65
Unreduced early retirement age:	Later of age 60 and attainment of 30 years of service
Termination benefit:	Accrued pension deferred to age 65

Actuarial Assumptions and Methods:

Interest rate:	5% per year
Retirement rates:	75% at unreduced early retirement age and remainder at age 65
Termination rates:	10% per year for members with less than 5 years of service
Other pre-retirement decrements:	None
Actuarial cost method:	Entry Age Normal
Asset valuation method:	Market value of assets

Annuity factors:

$\ddot{a}_{65}^{(12)} = 12.5$ $\ddot{a}_{64}^{(12)} = 12.8$ $\ddot{a}_{63}^{(12)} = 13.1$ $\ddot{a}_{62}^{(12)} = 13.4$ $\ddot{a}_{61}^{(12)} = 13.7$ $\ddot{a}_{60}^{(12)} = 13.9$

Active participant data at December 31, 2022:

	Member A	Member B
Age	30	62
Service	3	30

Financial information:

Market value of assets at December 31, 2022:	\$500,000

6. **Continued**

(a) (*4 points*) Calculate the unfunded accrued liability and normal cost of the plan at December 31, 2022.

The response for this part is to be provided in the Excel spreadsheet.

(b) (*2 points*) You are given the following for 2023:

- Member B retires on January 1, 2023 and starts receiving a pension from the plan under the normal form.
- A contribution of $10,000 is made to the plan on January 1, 2023.
- The plan's fund earns a rate of return of 10% during 2023.

Calculate the unfunded accrued liability at December 31, 2023.

The response for this part is to be provided in the Excel spreadsheet.

(c) (*4 points*) Calculate the gains and losses by source for 2023.

The response for this part is to be provided in the Excel spreadsheet.

7.

(*9 points*)

You are given the following information for two members who have terminated from a single-employer defined benefit pension plan registered in Ontario:

Personal Information:

	Member A	**Member B**
Date of Birth:	March 1, 1970	March 1, 1975
Date of Termination:	March 1, 2022	March 1, 2022
Pensionable Service:	12 years	5 years
Eligibility Service:	13 years	5 years
Accrued Benefit:	$25,000 per year	$15,000 per year

Plan Details:

Indexation:	50% of inflation (pre- and post-retirement)
Eligibility for Early Retirement:	Age 55
Eligibility for Unreduced Early Retirement:	85 Points (Age plus Eligibility Service)
Eligibility for Portability:	All ages
Early Retirement Reductions:	2% per year from age 65
Normal Retirement Age:	Age 65

7. **Continued**

You are given the following bond yields:

Month	Government of Canada 7-year Bond (V122542)	Government of Canada Long-term Bond (V122544)	Government of Canada 10-year Bond (V122553)
Feb 2022	1.81%	2.23%	0.56%
Mar 2022	2.41%	2.41%	0.58%
Apr 2022	2.64%	2.79%	0.91%

Month	Mid-Term Provincial Bond Index	Mid-Term Corporate Bond Index	Mid-Term Federal Non-Agency Bond Index
Feb 2022	2.54%	3.41%	1.92%
Mar 2022	3.02%	4.05%	2.42%
Apr 2022	3.35%	4.48%	2.76%

Month	Long-Term Provincial Bond Index	Long-Term Corporate Bond Index	Long-Term Federal Non-Agency Bond Index
Feb 2022	3.20%	4.03%	2.24%
Mar 2022	3.35%	4.29%	2.45%
Apr 2022	3.78%	4.83%	2.82%

7. Continued

(a) (*4 points*) Calculate the commuted value discount rates under section 3500 of the Canadian Institute of Actuaries' Standards of Practice as at the members' date of termination.

The response for this part is to be provided in the Excel spreadsheet.

You are given the following annuity factors:

${}_{8\|}\ddot{a}_{47}^{(12)}$	18.4	${}_{14\|}\ddot{a}_{47}^{(12)}$	13.9	${}_{4\|}\ddot{a}_{52}^{(12)}$	20.0	${}_{10\|}\ddot{a}_{52}^{(12)}$	15.1
${}_{9\|}\ddot{a}_{47}^{(12)}$	17.6	${}_{15\|}\ddot{a}_{47}^{(12)}$	13.2	${}_{5\|}\ddot{a}_{52}^{(12)}$	19.2	${}_{11\|}\ddot{a}_{52}^{(12)}$	14.4
${}_{10\|}\ddot{a}_{47}^{(12)}$	16.8	${}_{16\|}\ddot{a}_{47}^{(12)}$	12.5	${}_{6\|}\ddot{a}_{52}^{(12)}$	18.3	${}_{12\|}\ddot{a}_{52}^{(12)}$	13.6
${}_{11\|}\ddot{a}_{47}^{(12)}$	16.0	${}_{17\|}\ddot{a}_{47}^{(12)}$	11.9	${}_{7\|}\ddot{a}_{52}^{(12)}$	17.5	${}_{13\|}\ddot{a}_{52}^{(12)}$	12.9
${}_{12\|}\ddot{a}_{47}^{(12)}$	15.3	${}_{18\|}\ddot{a}_{47}^{(12)}$	11.3	${}_{8\|}\ddot{a}_{52}^{(12)}$	16.7		
${}_{13\|}\ddot{a}_{47}^{(12)}$	14.6	${}_{3\|}\ddot{a}_{52}^{(12)}$	20.9	${}_{9\|}\ddot{a}_{52}^{(12)}$	15.9		

(b) (*5 points*) Calculate the commuted values for Member A and Member B at their date of termination assuming the members terminated:

(i) Voluntarily; and

(ii) Involuntarily.

The response for this part is to be provided in the Excel spreadsheet.

8.

(*8 points*) Three members who participate in a defined benefit pension plan retired on January 1, 2022.

You are given the following as at January 1, 2022:

Plan provisions:

Normal retirement benefit:	$200 per month, multiplied by years of service
Bridge benefit:	None
Normal retirement age:	Age 65
Earliest retirement age:	Age 55
Unreduced early retirement age:	Age 62
Early retirement reduction:	Employment terminated on or after age 55: 3% per year prior to age 65 Employment terminated before age 55: actuarially equivalent
Postponed retirement:	Continued accrual after normal retirement age. In addition, benefits accrued prior to the normal retirement age are increased 6% per year of postponement
Normal form of payment:	Life only, payable monthly in advance
Optional forms of payment (available on an actuarially-equivalent basis):	Life guaranteed for 10 years, payable monthly in advance Level income option, payable monthly in advance, to the earlier of age 65 or death
Post-retirement annual indexation:	None

Member data as at January 1, 2022:

	Member A	**Member B**	**Member C**
Age at retirement at January 1, 2022:	61	61	66
Age at termination of employment:	46	56	66
Years of service accrued before age 65:	20	20	19
Years of service accrued after age 65:	0	0	1
Years of service (Total):	20	20	20
Elected optional form:	Life Only	Level Income Option, taking into account CPP and OAS	Life guaranteed for 10 years

8. **Continued**

Annuity factors:

	Immediate factors		
Age	**Life only**	**Life guaranteed for 10 years**	**Temporary to age 65**
55	19.3	19.5	8.2
56	19.1	19.3	7.6
57	18.8	19.1	6.8
58	18.6	18.9	6.1
59	18.3	18.6	5.3
60	18.0	18.3	4.5
61	17.7	18.0	3.6
62	17.4	17.8	2.8
63	17.1	17.5	1.9
64	16.8	17.2	1.0
65	16.5	17.0	0.0
66	16.1	16.6	0.0
67	15.8	16.4	0.0

	Factors deferred to age 65	
Age	**Life only**	**Life guaranteed for 10 years**
55	11.1	11.2
56	11.5	11.6
57	12.0	12.2
58	12.5	12.7
59	13.0	13.2
60	13.5	13.7
61	14.1	14.4
62	14.6	14.9
63	15.2	15.6
64	15.8	16.2
65	16.5	17.0

8. Continued

Additional information:

C/QPP Maximum Pension Benefit for 2022:	$1,253.59 per month
Maximum OAS payable in January 2022:	$642.25 per month
Income Tax Act Maximum Defined Benefit Limit for 2022:	$3,420 per year of service
YMPE for 2022:	$64,900

(a) (*1 point*) Calculate the maximum lifetime pension that applies to the three members under the Income Tax Act at their respective pension commencement ages.

The response for this part is to be provided in the Excel spreadsheet.

(b) (*7 points*) Calculate the monthly early retirement pension payable under the elected optional form of payment as at January 1, 2022 for each member.

The response for this part is to be provided in the Excel spreadsheet.

9.

(*7 points*)

Company ABC sponsors a defined benefit pension plan registered in Ontario that is open to new participants.

You are given the following information:

- All equity funds are actively managed
- Investment expenses for the equity investment managers are 0.65% of the equity asset value.
- Investment expenses for similar passive equity investment managers are 0.50% of the equity asset value.
- Investment management fees for the fixed income investment managers are 0.30% of the fixed income asset value.

Company ABC decided to adjust the asset mix for the plan and is implementing the following asset mix change over the next few months:

	Current Mix	**New Target Mix**
Equities		
Canadian	12%	4%
US	14%	7%
International	9%	9%
Fixed Income		
Canadian Corporate Bonds	15%	19%
Canadian Government Bonds	9%	14%
US Corporate Bonds	26%	29%
International Corporate Bonds	15%	18%

The diversification effect of each asset mix is as follows:

	Current Mix	**New Target Mix**
Diversification Effect	0.40%	0.20%

9. Continued

The long-term expected returns of the various asset classes are as follows:

	Total expected return if passively managed	**Total expected return if actively managed**
Equities		
Canadian	5.32%	6.40%
US	6.28%	7.48%
International	5.61%	6.72%
Fixed Income		
Canadian Corporate Bonds	1.39%	n/a
Canadian Government Bonds	0.96%	n/a
US Corporate Bonds	1.68%	n/a
International Corporate Bonds	1.34%	n/a

(a) (*3 points*) Calculate the best-estimate going concern discount rate using the building block approach.

ANSWER:

(b) (*2 points*) Describe the consideration for using value added returns from active management when establishing a going concern discount rate.

ANSWER:

(c) (*2 points*) Describe the other available method for establishing a going concern discount rate and when it would be appropriate to use.

ANSWER:

****END OF EXAMINATION****