CURATED PAST EXAM ITEMS
- Questions -

RET 101 – Retirement Plan Design

Important Information:

- These curated past exam items are intended to allow candidates to focus on past SOA fellowship assessments. These items are organized by topic and learning objective with relevant learning outcomes, source materials, and candidate commentary identified. We have included items that are relevant in the new course structure, and where feasible we have made updates to questions to make them relevant.
- Where an item applies to multiple learning objectives, it has been placed under each applicable learning objective.
- Candidate solutions other than those presented in this material, if appropriate for the context, could receive full marks. For interpretation items, solutions presented in these documents are not necessarily the only valid solutions.
- Learning Outcome Statements and supporting syllabus materials may have changed since each exam was administered. New assessment items are developed from the current Learning Outcome Statements and syllabus materials. The inclusion in these curated past exam questions of material that is no longer current does not bring such material into scope for current assessments.
- Thus, while we have made our best effort and conducted multiple reviews, alignment with the current system or choice of classification may not be perfect. Candidates with questions or ideas for improvement may reach out to education@soa.org. We expect to make updates annually.

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RET 101 Learning Objective 1 Curated Past Exam Questions

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RETDAC, Fall 2020, Q3

(9 *points*)

(a) (*3 points*) Compare and contrast the responsibilities outlined in CAPSA Guideline Number 8: Defined Contribution Pension Plans Guideline for each of the following:

(i) Plan Administrator

(ii) Employer

(iii) Plan Sponsor

ANSWER:

(b) (*3 points*) Describe how the information and tools recommended in CAPSA Guideline Number 8 help the Plan Administrator meet the responsibilities identified in part (a).

ANSWER:

(c) (*3 points*) Describe how benefit estimation tools can assist employees in mitigating quantifiable risks and behavioural risks.

ANSWER:

RETDAC/U, Fall 2020, Q11

(*8 points*)

(a) (*1 point*) Describe the policy ladder for a Canadian Target Benefit Plan (TBP).

ANSWER:

(b) (*3 points*) Describe three options available to a TBP to address the absence of a funding guarantee from a plan sponsor.

ANSWER:

(c) (*4 points*) Describe four non-investment mechanisms that can be used to reduce benefit risk in a TBP.

ANSWER:

RETDAC, Spring 2022, Q8

(*6 points*) Company ABC sponsors a defined benefit (DB) pension plan with the following provisions:

Benefit Service	One year granted for at least 1,800 hours worked in a year; no partial credit; capped at 25 years
Final Average Pay	Highest average of 3 consecutive years of actual pay out of the last 5 years
Normal Retirement Age	65
Early Retirement Age	55 with 5 years of service
Early Retirement Benefit	Reduced 3% per year from age 62 if 10 or more years of service; actuarially reduced from Normal Retirement Age otherwise

Company ABC is implementing a phased retirement program.

(a) (*3 points*) Recommend design changes to each of the following plan provisions to encourage utilization of the phased retirement program:

(i) Benefit service

(ii) Final average pay

(iii) Early retirement benefits

Justify your response.

ANSWER:

(b) (NO LONGER RELEVANT) (*3 points*) Assess the impact of a proposed plan design change from each subsection of part (a) under International Accounting Standard IAS 19, Rev. 2011 on the following:

(i) Defined Benefit Obligation

(ii) Service Cost

No calculations required and justify your response.

ANSWER:

RETDAC/U, Spring 2022, Q13

(*8 points*)

(a) (*2 points*) Describe the advantages of integrating an employer provided retirement plan with a defined benefit social security program from the plan sponsor's perspective.

ANSWER:

(b) (*2 points*) Propose two ways to integrate an employer provided retirement plan with a defined benefit social security program.

ANSWER:

(c) (*4 points*) Describe the challenges in achieving full integration of an employer provided retirement plan with a defined benefit social security program.

ANSWER:

RETRPIRM, Spring 2022, Q2

(*7 points*)

(a) (*3 points*) Describe the risks faced by plan members of a defined contribution (DC) pension plan with assets invested in target date funds during the:

(i) accumulation phase; and

(ii) decumulation phase.

ANSWER:

(b) (*4 points*) Recommend strategies to mitigate the risks identified in (a).

ANSWER:

RETDAC/U, Fall 2022, Q4

(*7 points*)

(a) (*2 points*) Describe how redistributions occur among defined benefit pension plan participants with employee contributions and accrual rates which:

(i) Do not vary with age

(ii) Vary with age

ANSWER:

(b) (*3 points*) Describe how the characteristics of the following pension arrangements affect risk sharing between the plan participants and plan sponsor:

(i) Traditional defined benefit plan

(ii) Cash balance plan

(iii) Collective defined contribution plan

ANSWER:

(c) (*2 points*) List the criteria used to assess the effectiveness of hybrid plans.

ANSWER:

RETDAC/U, Fall 2022, Q8

(*8 points*)

(a) (*3 points*) Describe the following types of pension plans for government employees that combine elements of defined contribution and defined benefit plans:

(i) Vertical Hybrid

(ii) Horizontal Hybrid

(iii) Choice Scheme

ANSWER:

You are given the following information for a non-contributory pension plan with immediate eligibility that offers the following three options:

Option	**Formula**
Defined benefit (DB)	Career average pension of 1% of income for each year of service payable at age 65
Defined contribution (DC)	Accumulated contributions of 8% of salary per year
Hybrid	Career average pension of 0.5% of income for each year of service payable at age 65 plus accumulated contributions of 5% of salary per year before age 50 and 2% thereafter

You are provided with the following assumptions:

Annual investment rate of return	4%
Annual salary increase rate	1%
Annual accrual and contribution limits	None
Annuity factor at age 65	14.0
Pre-retirement mortality for hybrid and DB	None
Timing of hybrid and DC contributions	End of year

(b) (*5 points*) Assess which option is the most advantageous for a new hire age 45 based on the assumptions provided.

Show all work and justify your response.

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

RETDAC/U, Fall 2022, Q10

(*7 points*)

(a) (*2 points*) Describe the risk-sharing features of Association of Canadian Pension Management Target Benefit Plan concept (TBP).

ANSWER:

(b) (*2 points*) Describe the shortcomings of traditional defined contribution plans and traditional defined benefit plans when compared to TBP.

ANSWER:

(c) (*3 points*) Explain how the different components of mortality risk are shared between plan participants and the plan sponsor in the following:

(i) Traditional defined contribution plans

(ii) Traditional defined benefit plans

(iii) TBP

ANSWER:

RETDAC, Fall 2022, Q11

(*9 points*) An administrator of a defined contribution pension plan has chosen to follow the guidance provided by the Canadian Association of Pension Supervisory Authorities (CAPSA).

(a) (*5 points*) Describe information the administrator should provide in the following situations:

(i) Member who decides to retire

(ii) Removal of an investment option

(iii) Replacement of an investment option

ANSWER:

(b) (*4 points*) Identify information the administrator should provide to members for a variable benefit retirement option that pays income directly from the plan.

ANSWER:

RETRPIRM, Spring 2023, Q1

(*6 points*)

(a) (*4 points*) Describe desirable features for target date fund design.

ANSWER:

(b) (*2 points*) Describe diversification solutions that address the following risks in target date funds:

(i) Growth risk

(ii) Inflation risk

(iii) Market risk

ANSWER:

RETDAC/U, Spring 2024, Q3

THIS QUESTION REFERENCES THE FOLLOWING CASE STUDY:
RETDAC Case Study Spring 2024

(*8 points*) NOC is implementing a phased retirement program.

(a) (*2 points*) Describe the advantages and disadvantages of offering a phased retirement program from NOC's perspective.

ANSWER:

(b) (*3 points*) Compare and contrast the potential impacts of the following phased retirement schedules from NOC's perspective:

(i) 75% of full time during phased retirement

(ii) 25% of full time during phased retirement

ANSWER:

Gevrey enacts a law allowing for in-service distributions at age 62.

(c) (*3 points*) Describe the advantages and disadvantages of incorporating an in-service distribution option in the National Oil Pension Plan.

ANSWER:

RETDAC/U, Spring 2024, Q6

(*9 points*)

(a) (*3 points*) Analyze how the following affect benefit levels in a target benefit plan:

(i) Asset mix

(ii) Using risk-free discount rate to value liability

(iii) Using best estimate discount rate to value liability

ANSWER:

(b) (*2 points*) Describe the advantages and disadvantages of a "no-action range" in a target benefit plan where benefit adjustments, positive or negative, are not implemented.

ANSWER:

(c) (*4 points*) Describe the advantages and disadvantages of a public sector target benefit plan from the employer's perspective.

ANSWER:

RETDAU, Spring 2024, Q4

(*9 points*)

(a) (*4 points*) Explain the risks associated with cash balance plans from the perspective of the following:

(i) Plan sponsors

(ii) Plan participants

ANSWER:

(b) (NO LONGER RELEVANT) (*3 points*) Critique the use of the following assumptions in a cash balance plan:

(i) 100% of participants take a lump sum immediately upon termination or retirement

(ii) Age 62 single point retirement age

(iii) An interest crediting rate 50 basis points lower than the discount rate

ANSWER:

Company XYZ sponsors a cash balance plan. A participant will be retiring as part of a voluntary separation program in 2 years.

You are given the following information about the participant:

Current Cash Balance Account	$150,000
Sum of Cash Balance Credits	$135,000
Next Year Salary	$75,000
Final Year Salary Increase	5%
Cash Balance Pay Credit	6%
Annuity Conversion Factor	10.5

- Pay credits are made at the end of the year.
- The plan uses actual return on plan assets to calculate interest credits each year.

(c) (*2 points*) Calculate the replacement ratio assuming an asset return of -15% in year 1 and 4% in year 2.

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

RETDAC/U, Fall 2024, Q4

THIS QUESTION REFERENCES THE FOLLOWING CASE STUDY:
RETDAC Case Study Spring 2024

(*9 points*) NOC has decided to convert its defined benefit pension plan into a target benefit plan.

(a) (*4 points*) Describe the advantages and disadvantages of a target benefit plan from the following perspectives:

(i) NOC

(ii) NOC employees

ANSWER:

(b) (*3 points*) Recommend changes to NOC's defined benefit plan provisions to qualify it as a target benefit plan.

ANSWER:

(c) (*2 points*) Describe the potential uses of stochastic modeling when analyzing a target benefit plan.

ANSWER:

RET 101 Learning Objective 2 Curated Past Exam Questions

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RETDAC/U, Fall 2020, Q1

(*7 points*) Company ABC is a small company with a young and mobile workforce. Company ABC sponsors a final average pay defined benefit (DB) plan.

(a) (*1 point*) Describe four disadvantages of a DB plan from the perspective of Company ABC's employees.

ANSWER:

(b) (*2 points*) Describe how moving to a defined contribution (DC) pension plan can address the disadvantages described in part (a).

ANSWER:

(c) (*2 points*) Describe behavioral factors that may lead Company ABC's employees to make suboptimal choices if the company adopts a DC plan.

ANSWER:

(d) (*2 points*) Identify DC plan design features that Company ABC should consider to improve their employees' retirement income adequacy.

Justify your response.

ANSWER:

RETDAC/U, Fall 2020, Q2

(*9 points*) An employer representing 30% of the active workforce in an underfunded defined benefit Multi-Employer Pension Plan (MEPP) is withdrawing from the MEPP due to bankruptcy.

(a) (*2 points*) Describe the following risks from the perspectives of the remaining participating employers and plan members.

(i) Funding risk

(ii) Risk of decline in work hours

(iii) Risk of intergenerational transfers

ANSWER:

To address the unfunded liability, the Board of Trustees is considering a plan amendment to decrease both accrued benefits and pensions in payment.

(b) (*4 points*) Describe the advantages and disadvantages of the proposed amendment from the following perspectives:

(i) Remaining participating employers

(ii) Plan members

ANSWER:

(c) (*3 points*) Describe three alternatives to address the ongoing funding of the MEPP after the withdrawal of a large employer and barriers to their implementation.

ANSWER:

RETDAC/U, Fall 2020, Q8

(*3 points*)

(a) (*1 point*) Describe how a variable annuity pension plan delivers benefits.

ANSWER:

(b) (*2 points*) Explain how risks could be transferred between the employer and the employee under a variable annuity pension plan.

ANSWER:

RETDAC/U, Spring 2021, Q2

(*8 points*) Company ABC acquired Company XYZ through a share purchase. Company ABC sponsors an open defined contribution pension plan (Plan A). Company XYZ sponsors an open defined benefit pension plan (Plan X). Both plans target the same replacement ratio for a career employee working 30 years.

The combined company is considering the following options with respect to current employees within their retirement plans:

- Option 1: No change to either plan; employees continue to accrue benefits in their respective plans.

- Option 2: Company XYZ employees accrue benefits in Plan A prospectively. Plan X is frozen for benefit accruals.

- Option 3: Company XYZ employees are given the choice to either continue to accrue benefits in Plan X or enroll in Plan A going forward and convert past service to Plan A. For employees who convert past service to Plan A, the lump sum value of their accrued pension in Plan X on the date of conversion becomes the initial account balance in Plan A.

In each option future employees will join Plan A. Assume all options are legally allowed in their jurisdiction.

(a) (*6 points*) Analyze the impact of the three options on the following:

(i) Accounting cost to the merged company (NO LONGER RELEVANT TO RET101)

(ii) Administrative cost to the merged company

(iii) Disruption to current employees

ANSWER:

Company ABC selected Option 3.

(b) (*2 points*) Recommend which plan the following employees should choose:

(i) 30-year old with one year of service in Plan X

(ii) 55-year old with 25 years of service in Plan X

No calculations required. Justify your response.

ANSWER:

RETDAC/U, Spring 2021, Q4

(*8 points*)

(a) (*4 points*) Compare and contrast a Multi-Employer Pension Plan's (MEPP) risk sharing structure to the risk sharing structure of the following :

(i) Single employer defined contribution pension plan

(ii) Single employer defined benefit pension plan

ANSWER:

(b) (*4 points*) Propose three investment strategies to mitigate risks in a MEPP. (NO LONGER ENTIRELY RELEVANT TO RET 101)

Justify your response.

ANSWER:

RETDAC/U, Fall 2021, Q10

(*9 points*) Company XYZ has an employer funded defined benefit pension plan and is considering two different plan options:

Plan Provision	**Option 1**	**Option 2**
Annual lifetime pension	1.40% of final average pensionable earnings up to $50,000; and 2.00% of final average pensionable earnings above $50,000 multiplied by years of pensionable service	1.80% of final average pensionable earnings for all earnings multiplied by years of pensionable service
Post-retirement indexation	Indexed at 50% of inflation	Indexed at 2% per year
Early retirement reduction	0.25% per month prior to age 60	0.50% per month prior to age 65
Normal form of pension	If married, 60% joint survivor pension without reduction If not married, single life annuity	Single life annuity for all members Joint survivor pension available on an actuarially equivalent basis

(a) (*3 points*) Describe the differences in the following risks between Option 1 and Option 2 from the perspective of Company XYZ:

(i) Longevity risk

(ii) Inflation risk

(iii) Retirement risk

ANSWER:

You are given the following information about two employees who may participate in the pension plan:

	Employee A	Employee B
Expected final average pensionable earnings at retirement	$150,000	$45,000
Expected age at retirement	62	58
Marital status	Not married	Married
Service at Retirement	15 years	25 years

(b) (*4 points*) Evaluate each plan provision independently under Option 1 and Option 2 from the perspective of:

(i) Employee A

(ii) Employee B

Justify your response.

ANSWER:

(c) (*2 points*) Calculate the replacement ratio provided by the pension plan as a percentage of final average earnings at retirement for Employee A assuming all service was earned under:

(i) Option 1

(ii) Option 2

Show all work.

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

RETDAC/U, Spring 2022, Q2

THIS QUESTION REFERENCES THE FOLLOWING CASE STUDY:
Spring 2022 Retirement Benefits—Design and Accounting, Canada Exam Case Study

(*6 points*) National Oil Company (NOC) wants to implement a defined contribution plan for its employees in Gevrey.

The plan will allow the following:

- Voluntary employee contributions up to 10% of salary
- Matching employer contributions of 100% of employee contributions to a maximum of $5,000 per annum
- Withdrawals permitted every 2 years up to 25% of the accumulated account balance

(a) (*3 points*) Describe the risks of the proposed plan design from the perspective of plan participants.

ANSWER:

(b) (*3 points*) Recommend six changes to the plan design that would help participants maximize retirement income.

Justify your response.

ANSWER:

RETDAC/U, Spring 2023, Q1

(*8 points*) Company XYZ sponsors a final average earnings defined benefit pension plan (DB plan).
The DB plan is frozen for both service and pay and replaced with a defined contribution plan (DC plan) for future accruals.
You are given the following:

	Participant A	Participant B
Age at freeze date	60	25
Service at freeze date	25	3

(a) (*6 points*) Compare and contrast three risks faced by both participants.

ANSWER:

(b) (*2 points*) Describe provisions that can be included in a DC plan to improve post-retirement income adequacy.

ANSWER:

RETDAC/U, Spring 2023, Q5

(*10 points*) Municipality ABC sponsors a defined benefit pension plan with the following provisions:

Plan Structure	Three-year final average earnings with employee contributions
Cost of Living Adjustment (COLA)	Full inflation
COLA Eligibility	Participants who have attained age 65 and been retired for ten years

After a decade of annual inflation of 2% or less, in one year inflation increases to 9%.

(a) (*4 points*) Describe the impact of the current inflationary environment on the following stakeholders of Municipality ABC's pension plan.

(i) Society/taxpayers

(ii) Municipality ABC

(iii) Current and future plan participants

ANSWER:

(b) (*4 points*) Propose two alternative COLA structures that result in more equitable sharing of the inflation risk among current retirees, future retirees, and Municipality ABC.

Justify your response.

ANSWER:

(c) (*2 points*) Describe how changing from a defined benefit structure to a defined contribution structure would impact the inflation risk faced by the following stakeholders:

(i) Current and future plan participants

(ii) Society/taxpayers

ANSWER:

RETDAC/U, Spring 2023, Q7

(*9 points*)

(a) (*3 points*) Identify the design and governance characteristics of a traditional multiemployer pension plan (MEPP).

ANSWER:

(b) (*3 points*) Compare and contrast participation in a MEPP and a single employer defined contribution pension plan from the perspective of the plan participants.

ANSWER:

(c) (*3 points*) Propose three ways a Board of Trustees could mitigate financial risks in a fully funded MEPP with a significant retiree population.

Justify your response.

ANSWER:

RETDAC/U, Fall 2023, Q1

(*7 points*)

(a) (*4 points*) Describe the differences in risks faced by the plan participants of a traditional defined benefit pension plan to the risks faced by plan participants in the following types of plans:

(i) Traditional defined contribution pension plans

(ii) Flexible pension plans

(iii) Variable annuity plans

(iv) Target benefit plans

ANSWER:

Company ABC sponsors a traditional defined benefit pension plan with the following design features:

Benefit accrual	$50 per month per year of service
Indexing	None
Early retirement reduction	Actuarial equivalence from normal retirement age based on market interest rates

(b) (*3 points*) Recommend three risk sharing plan design features that can help mitigate economic risks faced by Company ABC's plan participants.

ANSWER:

RETDAC/U, Spring 2024, Q10

(*8 points*)

(a) (*3 points*) Describe three risks faced by a retiree in a capital accumulation plan.

ANSWER:

(b) (*3 points*) Critique the following decumulation strategies of a capital accumulation plan.

(i) Constant withdrawal amount

(ii) Dynamic withdrawal amount

(iii) Draw-to-target

ANSWER:

You are provided with the following information:

Member Information

Current age	55
Age at retirement	62
Service at retirement	7
Pensionable earnings at age 55	$100,000
Annual salary increase	2.0%

Defined Benefit Plan

Annual lifetime pension	0.75% of final 3-year average earnings multiplied by years of service
Early retirement reduction	0.25% per month prior to age 65

Defined Contribution Plan

Employee contributions	3.00% of pensionable earnings
Assumed annual rate of return	6.00%
Timing of contributions	Mid-year
Annuity factor at age 62	17

(c) (*2 points*) Calculate the required employer contribution rate under the defined contribution plan to provide the member with the same replacement ratio as a percentage of 3-year average earnings under the defined benefit plan.

Show all work.

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

RET 101 Learning Objective 3 Curated Past Exam Questions

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RETDAC/U, Fall 2020, Q6

(*11 points*) Company ABC sponsors a pension plan and a retiree health benefit (NO LONGER RELEVANT) program for its union hourly employees. Hourly employees have the following characteristics:

- Specialized knowledge or skills are not required.
- Varying years of service.
- Wages are tied to years of service.

Company ABC needs to reduce costs through workforce reduction and is considering the following:

Option 1: Offering an early retirement incentive program (ERIP)

Option 2: Implementing involuntary layoffs

(a) (*4 points*) Compare and contrast the two options.

ANSWER:

Company ABC has decided to proceed with an ERIP. You have been given the following information about the current benefit programs:

Pension Plan Provisions	
Eligibility	Immediate
Vesting	100% after 5 years of service
Normal Retirement Age	65
Early Retirement Age	55 with 10 years of service
Normal Retirement Benefit	$80 per month times years of service
Early Retirement Benefit	Unreduced benefit at 62 with 30 years of service, otherwise reduced by 0.25% per month that early retirement precedes Normal Retirement Age

Retiree Health Benefit Program Plan Provisions	
Eligibility	Immediate
Earliest Retirement Age	55 and 20 years of service
Retirement Benefit	Retirees and their spouses may elect to participate in a self-insured health plan, with 100% of the plan cost paid by the employer
Pre-retirement/termination benefits	None

(b) (*2 points*) Describe considerations when determining the eligibility criteria for the ERIP.

ANSWER:

(c) (*3 points*) Propose four ways to maximize the success of the ERIP.

Justify your response.

ANSWER:

(d) (*2 points*) List the information that should be included in the ERIP announcement to employees.

ANSWER:

RETDAC, Fall 2021, Q1

(*9 points*) Company ABC sponsors a defined benefit pension plan with the following objectives:

- Share retirement costs with employees
- Predictable company costs
- Attract younger employees
- Retain long service employees

The key provisions of the pension plan are below:

Provision	**Defined Benefit Plan**
Vesting	100% after 2 years of service
Pensionable Earnings	Base pay and overtime
Normal Retirement Eligibility	Age 65
Employee Contributions	5% of pensionable earnings
Benefit Formula	2% of final average pensionable earnings (last 36 consecutive months)
Early Retirement Eligibility	Age 55 and 10 years of service
Early Retirement Benefit	Accrued benefit reduced by 0.25% per month that early retirement precedes Normal Retirement
Termination Benefit	Actuarially equivalent to pension payable at Normal Retirement
Portability	Lump sum available on termination and retirement
Indexation	After pension commencement, pension benefits are indexed annually to inflation

(a) (*5 points*) Critique the plan provisions with respect to Company ABC's objectives.

Justify your response.

ANSWER:

Company ABC management distributes overtime hours with priority to long service employees and the associated pay can make up a significant portion of their earnings.

(b) (*2 points*) Evaluate how the overtime policy aligns with Company ABC's objectives for the defined benefit pension plan..

ANSWER:

(c) (*2 points*) Recommend two changes to the plan design if Company ABC wants to keep the overtime policy.

Justify your response.

ANSWER:

RETDAC/U, Fall 2021, Q5

(*6 points*) Compare and contrast the considerations when designing an early retirement incentive program for the following:

(i) Public sector pension plan

(ii) Private sector pension plan

ANSWER:

RETDAC/U, Fall 2022, Q7

(*11 points*) Unions representing employees in the same industry participate in a multi-employer pension plan (MEPP) with the following plan provisions:

Provision	**Defined Benefit MEPP**
Normal Retirement Age	Age 62
Benefit Formula	1.5% of final average earnings (last 60 consecutive months of base earnings) times years of service
Contribution	Employer: $6 per hour Employee: none
Early Retirement Benefit	Reduced by 0.25% per month when retirement precedes the Normal Retirement Age
Form of Benefit	Life guaranteed for 10 years
Optional Forms of Benefit	Lump sum
Post-Retirement Indexing	Benefits indexed at 2/3 inflation

(*4 points*) Compare and contrast the plan provisions to those of a traditional MEPP.

ANSWER:

The Board of Trustees would like to reduce risk and volatility by aligning the plan provisions with a traditional MEPP.

(a) (*3 points*) Recommend four changes to the plan provisions to meet the Board's objectives.

Justify your response.

ANSWER:

(b) (NO LONGER RELEVANT TO RET 101) (*4 points*) Propose four plausible adverse scenarios to measure risks inherent in MEPPs under a going concern valuation.

Justify your response.

ANSWER:

RETDAC/U, Fall 2023, Q4

THIS QUESTION REFERENCES THE FOLLOWING CASE STUDY:
Fall 2023 Design and Accounting (RETDAC) Exam – Canada – Case Study

(*9 points*) NOC is considering offering an early retirement incentive program (ERIP) with the following features:

- All vested active employees over age 55 are eligible
- Retirement benefit is unreduced
- Best average earnings are based on earnings in the 12 consecutive months prior to retirement

(a) (*4 points*) Evaluate the potential effects of the ERIP on NOC.

ANSWER:

(b) (*3 points*) Describe steps NOC should take to implement the ERIP.

ANSWER:

One year after the ERIP, NOC's actuary is conducting an experience study.

(c) (*2 points*) Describe the considerations for setting the retirement assumption. (NO LONGER RELEVANT)

ANSWER:

RETDAC/U, Fall 2023, Q6

(*8 points*) Company ABC sponsors a defined benefit pension plan with the following plan provisions:

Normal Retirement Benefit	2% of final 3-year average pensionable earnings times years of service
Pensionable Earnings	Base pay plus bonus
Normal Form of Pension	Life annuity with 15-year guarantee
Normal Retirement Age	Age 65
Early Retirement	Age 55, reduced by 3% per year prior to age 65
Unreduced Pension	Age 60 with 10 years of service
Cost of Living Adjustments	100% of CPI

(a) (*4 points*) Assess the risks of these plan provisions from the employer's perspective.

ANSWER:

(b) (*2 points*) Recommend changes to four of the plan provisions to reduce the risks identified in part (a) other than freezing future service or salary accruals.

Justify your response.

ANSWER:

Company ABC has decided to keep the plan provisions unchanged but would like to reduce its risk exposure.

(c) (*2 points*) Describe barriers to de-risking the pension plan through a pension risk transfer to an insurance company.

ANSWER:

RETDAC/U, Fall 2023, Q9

(*7 points*)

(a) (*2 points*) Describe the two categories of embedded options in defined benefit pension plans.

ANSWER:

You are given the following information regarding a single-employer defined benefit pension plan:

- Cost of Living Adjustments (COLAs) provide increases of 100% of the Consumer Price Index (CPI) to retirees in years when the pension fund return exceeds 3%.
- The pension plan has a funded status of 70%.

(b) (*4 points*) Describe the risks of the COLA provision from the perspectives of the following:

(i) The employer

(ii) The retirees

ANSWER:

(c) (*1 point*) Propose changes to the COLA provision to mitigate the employer risks.

ANSWER:

RETDAC/U, Fall 2024, Q6

(*8 points*)

(a) (*4 points*) Explain how public sector defined benefit pension plans are exposed to risk by the following sources:

(i) Contribution policy

(ii) Governance

(iii) Long time horizon

ANSWER:

(b) (*4 points*) Describe the advantages and disadvantages of the pooling of the following risks inherent in public sector defined benefit pension plans:

(i) Longevity

(ii) Investments

ANSWER:

RETDAC/U, Fall 2024, Q8

(*8 points*) Company ABC is acquiring a division of Company XYZ through an asset-purchase transaction. Both companies sponsor defined benefit pension plans.

(a) (*2 points*) Identify the information Company ABC should obtain about Company XYZ's pension plan as part of the due diligence process before entering into an asset purchase transaction.

ANSWER:

The plan provisions for both companies' defined benefit pension plans are as follows:

Plan Provisions	**Company ABC**	**Company XYZ**
Benefit	2.0% Final Average Earnings x Service	2.0% Career Average Earnings x Service
Unreduced Retirement Age	Age 65 or 85 points (points = age + service)	Age 65
Funded Status	70% Funded	120% Funded

(b) (*2 points*) Evaluate an arrangement where Company XYZ retains the past service liability from the following perspectives:

(i) Company ABC

(ii) Transferring employees of Company XYZ

ANSWER:

(c) (*2 points*) Evaluate a wraparound arrangement from the following perspectives:

(i) Company ABC

(ii) Transferring employees of Company XYZ

ANSWER:

(d) (*2 points*) Evaluate a carve-out arrangement from the following perspectives:

(i) Company ABC

(ii) Transferring employees of Company XYZ

ANSWER:

RET 101 Learning Objective 4 Curated Past Exam Questions

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RETDAC/U, Fall 2020, Q7

THIS QUESTION REFERENCES THE FOLLOWING CASE STUDY:
Fall 2020 Retirement Benefits—Design and Accounting, Canada Exam Case Study

(*8 points*) NOC is implementing a phased retirement program.

(a) (*2 points*) Describe the advantages of offering a phased retirement program from NOC's perspective.

ANSWER:

(b) (*6 points*) Recommend three plan design changes that NOC should make to its retirement benefit plans to ensure equitable treatment between those who participate in the phased retirement program and those who remain full time employees.

Justify your response.

ANSWER:

RETDAC/U, Fall 2020, Q12

THIS QUESTION REFERENCES THE FOLLOWING CASE STUDY:
Fall 2020 Retirement Benefits—Design and Accounting, Canada Exam Case Study

(*7 points*) NOC is considering ways to improve the future funded status of the National Oil Full-Time Pension Plan.

(a) (*2 points*) Analyze the impact on current and future funded status of the following:

(i) Closing the plan to new entrants

(ii) Freezing plan accruals

No calculations required.

ANSWER:

(b) (*3 points*) Propose a change to each of the following National Oil Full-Time Pension Plan provisions that would meet NOC's goal of improving the funded status of the plan:

(i) Early retirement eligibility

(ii) Best Average Earnings

(iii) Normal Retirement Age

Justify your response.

ANSWER:

(c) (*2 points*) Evaluate your proposed changes from part (b) from the perspective of:

(i) An employee age 25 with 2 years of service

(ii) An employee age 60 with 20 years of service

No calculations required.

ANSWER:

RETDAC, Fall 2021, Q4

(*12 points*) Company ABC wants to close and freeze their defined benefit (DB) plan. They want to replace future DB plan accruals with a new defined contribution (DC) plan. Company ABC has stated the following goals for the new DC plan:

- Provide the same lump sum value at retirement that the DB plan would provide if it was not frozen
- Provide the same DC contribution for all employees equal to a flat percent of pay over an employee's career
- Does not increase the accounting cost of annual accruals of the DB plan, as a percentage of base pay

You are given the following information:

Defined Benefit Plan formula	2% of final year base pay for each year of service
Early Retirement	Reduced 3% per year for retirement before age 65
Number of active plan participants	100
Average participant age	50
Average participant service	15
Average participant base pay	$100,000

Company ABC has instructed you to use following assumptions for this analysis:

- All employees retire at age 60
- Future salary increases: 0%
- Return on assets for future DC contributions: 6%
- No pre-retirement decrements
- Form of payment is 100% lump sum at retirement
- Lump sum conversion factor at age 60: 15
- Discount rate: 3.0%
- Contributions are made at the beginning of year

(a) (NO LONGER RELEVANT TO RET 101) (*2 points*) Calculate the Service Cost under International Accounting Standard IAS 19, Rev 2011 as a percentage of base pay for the existing DB plan for the average participant. (NO LONGER RELEVANT TO RET 101)

Show all your work.

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

(b) (*4 points*) Calculate the flat DC contribution as a percentage of base pay for the average participant necessary to restore the lump sum value lost due to the DB plan freeze.

Show all your work.

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

Company ABC wants to implement the DC plan and provide all employees the same DC contribution percentage using the methodology described in part (b) above.

(c) (*6 points*) Critique the appropriateness of this suggested design based on the stated goals of Company ABC.

ANSWER:

RETDAC/U, Fall 2022, Q1

(*8 points*)

(a) (*3 points*) Compare and contrast the single lump sum and partial withdrawal distribution options from a defined contribution plan from the perspective of:

(i) Plan sponsor

(ii) Plan participants

ANSWER:

(b) (*3 points*) Compare and contrast the installment payment program and annuity distribution options from a defined contribution plan from the perspective of:

(i) Plan sponsor

(ii) Plan participants

ANSWER:

(c) (*2 points*) Describe considerations for a plan sponsor's evaluation of defined contribution plan distribution options.

ANSWER:

RETDAC/U, Spring 2023, Q8

(*6 points*) A plan sponsor wants to add a variable annuity provision to its career average defined benefit pension plan.

(a) (*2 points*) Describe how a variable annuity provision works.

ANSWER:

(b) (*2 points*) Describe two methods for adjusting accrued benefits payable under a variable annuity provision.

ANSWER:

(c) (*2 points*) Explain the impact of adding a variable annuity provision on the following:

(i) Investment risk

(ii) (NOT ENTIRELY RELEVANT TO RET 101) Valuation of liabilities

ANSWER:

RETDAC, Fall 2023, Q3

(*4 points*) Company A and Company B sponsor defined contribution (DC) pension plans. The two companies have merged.

You are given the following:

	Company A	**Company B**	**Proposed Plan Provisions for the Merged Company**
Member contributions	3% to 7% of base salary	Not allowed	4% to 6% of base salary
Company contributions	X% of member contributions based on points (age plus service): 30 points – 50% 40 points – 75% 50 points – 100%	3.75% of base salary	75% of member contributions
Administrative expenses	Paid by Company A	0.25% of member account balance per year paid by members	0.25% of member account balance per year paid by members
Eligibility	Two years of service	Immediate	Two years of service

(a) (*3 points*) Assess the proposed plan provisions in respect of adverse amendments under *CAPSA Guideline No 8: Defined Contribution Plans*.

ANSWER:

The merged company is replacing an existing investment option in the DC Plan.

(b) (NO LONGER RELEVANT) (*1 point*) List what should be included in the notice to plan members to comply with *CAPSA Guideline No. 3: Capital Accumulation Plans*.

ANSWER:

RETDAU, Fall 2023, Q3

(*4 points*) Company XYZ employs six executives.

- Three have over twenty years of service and participate in both the company's defined benefit pension plan and defined contribution pension plan.
- The other three have less than five years of service and participate only in the defined contribution pension plan.

The company is considering implementing a Supplemental Executive Retirement Plan (SERP) and has the following objectives:

- Provide internal equity
- Minimize impact on company financials
- Target 75% income replacement

Describe plan design features for the SERP that should be considered in order to achieve these objectives.

ANSWER:

RETDAC/U, Spring 2024, Q9

(*6 points*)

(a) (*2 points*) Propose supplemental executive retirement plan provisions that plan sponsors can consider to address the following goals.

(i) Midcareer recruiting

(ii) Retention

Justify your response.

ANSWER:

Company ABC is recruiting an executive who is 8 years from retirement.

Company ABC is considering offering the executive an 8-year contract with one of the following options:

Option 1: Base salary of $650,000 with 60% target annual bonus paid each year

Option 2: Base salary of $700,000 with 0% target annual bonus plus:

- a total supplemental retirement benefit of $3,000,000, payable in 5 equal annual installments
- the benefit does not vest until retirement
- the benefit is not funded

(b) (*4 points*) Describe the advantages and disadvantages of the options from the perspective of:

(i) Company ABC

(ii) The executive

ANSWER:

RETDAC/U, Fall 2024, Q3

(*7 points*) An employer is negotiating a defined benefit pension arrangement for the first time with the union representing its employees.

The union workforce has the following characteristics:

- Mix of full-time and part-time members
- High turnover in low service employees

The employer has the following objectives for the arrangement:

- Encourage workforce to stay to age 65
- Minimize administrative burden
- Share cost with employees
- Limit the employer's inflation risk

The union has the following objectives for the arrangement:

- Cover all employees and be easy to understand
- Provide protection if a retiree dies shortly after retirement
- Preserve benefit value for members who terminate or die before retirement
- Minimize investment risk for employees
- Allow employees to retire starting at age 55

Recommend plan features that will balance the employer's and union's objectives.

Justify your response.

ANSWER: