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Mid Term Exam (SUGGESTED SOLUTIONS)
Intermediate Financial Accounting II
Fall 2016
ADM3340 Sections A, B, C

Section	Class time/day	Tick one
Section A	Tuesday 8:30am & Friday 10:00am	
Section B	Tuesday 7:00pm	
Section C	Wednesday 10:00am & Friday 8:30am	

Name: _____ **ID#:** _____

INSTRUCTIONS

- Write your name and student ID number above and indicate your section.
- Display your student ID on your desk during the exam.
- Reminder: it is an offence to have a cell phone or any other communication device in your possession during this exam's 2½ hours. (see the Statement of Academic integrity on page 2 of this exam).
- This examination "SUGGESTED SOLUTION" comprises 5 multi-part questions over 21 numbered pages.
- Answer all questions in this booklet.
- Booklet is **not** to be removed from the examination room. You may not separate the pages.
- Do not answer questions using a pencil or erasable pen: if you do you will forfeit the right to ask that your exam be remarked.
- Limit your answer to the space provided. Blank sheets for rough work and supporting calculations are given at the end of each question.
- This exam will be marked out of 100 marks (for convenience) and is 2½ hours long. You should budget approximately 1.5 minutes per mark. The exam is worth 40% of the overall course mark.
- Please do not ask the invigilator or the professor any questions, as they will not be answered. State reasonable assumptions, if you feel they are necessary.
- This exam paper must remain stapled: do not take this exam paper apart.
- Present value tables and Professor Burbage's "yield/effective interest rate approximation formula" are provided on pages 20 and 21.
- Language (non-electronic) dictionaries are allowed with the proctor's permission.
- You must provide an audit trail for any answers you generate with an electronic calculator.
- You ***must*** sign the Statement of Academic integrity on page 2 of this exam.

	Question		Marks
Ch 12	1: part 1	Goodwill; acquisition.	/8
	1: part 2	Intangibles & Goodwill: impairment under IFRS.	/9
Ch 13	2: part 1	ARO.	/4
	2: part 2	Premiums.	/11
	2: part 3	Liability: definition.	/3
	2: part 4	Contingencies.	/6
Ch 14	3: part 1	Bond liabilities: issuance.	/10
	3: part 2	Bond liabilities: retirement.	/10
	3: part 3	Bond liabilities: exchange.	/12
Ch 15	4: part 1	Share issuance.	/4
	4: part 2	Treasury stock.	/6
	4: part 3	Various.	/9
Ch 16	5:	Executory contracts, derivatives.	/8
	TOTAL		/100

Statement of Academic Integrity
The Telfer School of Management does not condone academic fraud, an act by a student that may result in a false academic evaluation of that student or of another student. Without limiting the generality of this definition, academic fraud occurs when a student commits any of the following offences: plagiarism or cheating of any kind, use of books, notes, mathematical tables, dictionaries or other study aid unless an explicit written note to the contrary appears on the exam, to have in his/her possession cameras, radios (radios with head-sets), tape recorders, pagers, cell phones, or any other communication device which has not been previously authorized in writing.

Statement to be signed by the student:
I have read the text on academic integrity and I pledge not to have committed or attempted to commit academic fraud in this examination.

Signed:_____

Note: an examination copy or booklet without that signed statement will not be graded and will receive an exam grade of zero.

QUESTION 1 (17 marks)
Answer ALL parts to this question. Each part is independent.

PART 1: (8 marks)

On July 31, 2016, Barrhaven Corporation purchased the net assets of Vanier Company by paying $204,000 cash to Vanier Company. At July 31, 2016, the statement of financial position of Vanier Company was as follows:

Cash	$ 75,000	Accounts payable	$300,000
Accounts receivable	102,000	Shareholders' Equity	239,000
Inventory	98,000		
Land	50,000		
Buildings (net)	75,000		
Equipment (net)	90,000		
Trademarks (net)	49,000		
	$539,000		$539,000

The recorded amounts all approximate current values except for land (worth $60,000), inventory (worth $125,000), and trademarks (worthless). The receivables are shown net of an allowance for doubtful accounts of $12,000. The amounts for buildings, equipment, and trademarks are shown net of accumulated amortization of $14,000, $23,000, and $47,000, respectively.

Required

Prepare the July 31, 2016 journal entry for Barrhaven Corporation to record the purchase.

Note that a purchase price of $204,000 is less than the fair value of the net assets of Vanier, resulting in negative goodwill of $23,000. Current standards (IFRS 3.34-36 & ASPE 1582.36) require the excess to be recognized as a gain in net income. However, this cannot be done without a thorough reassessment of all the variables, values, and measurement procedures used that resulted in this gain. [see Page 65 of RIM's 2011 Annual Report on ADM3340's BlackBoard for a real example of a "bargain purchase"].
If the review reveals no overstatement of assets, record as follows:

	Cash	75,000	
	Accounts Receivable	114,000	
	Inventory	125,000	
	Land	60,000	
	Buildings	75,000	
	Equipment	90,000	
	Allowance for Doubtful Accounts		12,000
	Accounts Payable		300,000
	Cash		204,000
	Gain		23,000

Alternatively (not required in your solution): if the review reveals an overstatement of inventory of $23,000, say, record as follows:

Cash	75,000	
Accounts Receivable	114,000	
Inventory ($125,000 – $23,000)	102,000	
Land	60,000	
Buildings	75,000	
Equipment	90,000	
Allowance for Doubtful Accounts		12,000
Accounts Payable		300,000
Cash		204,000

QUESTION 1 (17 marks) (continued)
Answer ALL parts to this question. Each part is independent.

PART 2: (9 marks)

	Limited-Life Intangible Assets.	Indefinite-Life Intangible Assets.	Goodwill [the values below pertain to the Cash-Generating-Unit, including its Goodwill].
Carrying amount	$8,000,000	$8,000,000	$32,000,000
Fair value	$7,210,000	$7,210,000	$32,300,000
Undiscounted future cash flows from use and eventual sale	$9,000,000	$8,200,000	$40,000,000
Present value of the future cash flows from use and eventual sale	$6,000,000	$7,200,000	$31,500,000
Costs to sell	$40,000	$40,000	$500,000

Required:
Using the above data complete the following grid, applying IFRS:

	Under IFRS		
	Limited-Life Intangible Assets.	Indefinite-Life Intangible Assets	Goodwill [the values below pertain to the Cash-Generating-Unit, including its Goodwill].
Is the asset impaired? Show supporting calculations.	Yes, because the carrying amount of **$8,000,000 exceeds** the recoverable amount (defined by IAS 36.6) of **$7,170,000** [which is the higher of the fair value $7,210,000 less the costs to sell of $40,000, and the present value of the future cash flows from use and eventual sale $6,000,000].	Yes, because the carrying amount of **$8,000,000 exceeds** the recoverable amount (defined by IAS 36.6) of **$7,200,000** [which is the higher of the fair value $7,210,000 less the costs to sell of $40,000, and the present value of the future cash flows from use and eventual sale $7,200,000].	Yes, because the carrying amount of **$32,000,000 exceeds** the recoverable amount (defined by IAS 36.6) of **$31,800,000** [which is the higher of the fair value $32,300,000 less the costs to sell of $500,000, and the present value of the future cash flows from use and eventual sale $31,500,000].
If the asset is deemed to be impaired, what is the amount of the impairment loss to be recognized in the income statement? Show supporting calculations.	**$830,,000** [= the carrying amount of $8,000,000 less the recoverable amount of $7,170,000].	**$800,000** [= the carrying amount of $8,000,000 less the recoverable amount of $7,200,000.	**$200,000** [= the carrying amount of $32,000,000 less the recoverable amount of **$31,800,000** . The $200,000 loss is allocated to the assets in accordance with IAS 36.104 and IAS 36.105.
(a) Can an impairment loss reversal be recognized in a subsequent period, and if so, (b) what is the limit, if any, to the reversal? Assume the company uses the cost model (i.e., not the revaluation model) subsequent to acquisition.	(a) Yes, under both the cost and revaluation models. (b) IAS 36.117: The increased carrying amount of an asset other than goodwill attributable to a reversal of an impairment loss shall not exceed the carrying amount that would have been determined less the amortisation or depreciation) had no impairment loss been recognised for the asset in prior years.	(a) Yes, under both the cost and revaluation models. (b) IAS 36.117: The increased carrying amount of an asset other than goodwill attributable to a reversal of an impairment loss shall not exceed the carrying amount that would have been determined less the amortisation or depreciation) had no impairment loss been recognised for the asset in prior years. [Comment: remember that an indefinite-life asset would have $0 accumulated amortization].	(a) No: IAS 36.124: An impairment loss recognised for goodwill shall not be reversed in a subsequent period. IAS 36.125: IAS 38 Intangible Assets prohibits the recognition of internally generated goodwill. Any increase in the recoverable amount of goodwill in the periods following the recognition of an impairment loss for that goodwill is likely to be an increase in internally generated goodwill, rather than a reversal of the impairment loss recognised for the acquired goodwill. (b) Not applicable

Comments in red not required in students' answers.

QUESTION 2 (24 marks)
Answer ALL parts to this question. Each part is independent.

PART 1: (4 marks)

Arafura Mines International Ltd discovered a new copper deposit in Papua, the Cenderawasih Mine, and began production on January 1, 2016. The state requires mining companies to return the land to its natural state at the end of mining activity. Arafura Mines International Ltd estimates that it will operate the mine for 25 years, at which time it will cost $25,000,000 for the land reclamation project. Arafura Mines International Ltd uses an 8% discount rate. The company has adopted IFRS for its financial reporting.

Required (Show all supporting calculations)
(a) Record any obligation for land reclamation as at January 1, 2016.
(b) Record any entry required related to this obligation at December 31, 2016.

(a) January 1, 2016

Cenderawasih Mine	**3,650,447**	
Asset Retirement Obligation		**3,650,447**

$3,650,447 is the present value of the $25,000,000 estimated cost discounted for 25 years at 8%.

(b) December 31, 2016

Accretion*/Interest Expense**	**292,036**	
Asset Retirement Obligation		**292,036**

$292,036 is the increase in the present value that occurs because you are one year closer to the expenditure. Present value of $25,000,000 discounted for 24 years at 8% ($3,942,483) less $3,650,447.
OR 3,650,447 x 8% = 292,036

*** ASPE (not asked by the question)**
**** IFRS**

QUESTION 2 (continued) (24 marks)
Answer ALL parts to this question. Each part is independent.

PART 2: (11 marks)

Banff Ltd. sells pies in an increasingly competitive market. In January 20XX Banff Ltd. commenced a premium promotion program with the objective of increasing its pie sales by providing pie-customers with coupons which can be redeemed along with a cash payment in exchange for baking-pans.

In 20XX Banff Ltd. purchased 340,000 baking-pans for $5.10 each for the promotion program. To acquire a baking-pan a customer must submit $3.50 cash and two coupons to Banff. Each baking-pan costs the company $5.10, and an additional $0.90 when shipping it to the customer. Each pie sold is accompanied by one coupon. A pie costs Banff Ltd. $2.25 and sells for $5.00. Using the relative stand-alone selling price basis Banff Ltd. determines that $1.20 of this $5.00 pertains to the one coupon that accompanies each pie.

In 20XX Banff Ltd. sold 1,000,000 pies and, based on its experience with similar premium promotion programs, estimates that 70% of these coupons will be redeemed. 300,000 coupons were actually redeemed by the end of 20XX. Banff Ltd.'s accounting year-end is 31 December.

Required

a) Prepare the journal entries that should be recorded in 20XX relative to the premium promotion program, assuming that Banff Ltd. follows a policy of charging the cost of coupons to expense in 20XX as they are redeemed and adjusting the program liability account at year-end.

20	Premium promotion program - baking-pan inventory	1,734,000	
21	Cash/payables		1,734,000
22	*To record purchase of premium promotion program - baking-pan inventory: $1,734,000 = 340,000 x $5.10.*		
23	Cash	5,000,000	
24	Sales revenue		5,000,000
25	*To record sale of pies: $5,000,000 = 1,000,000 x $5.00.*		
26	Cost of goods sold (pies)	2,250,000	
27	Inventory (pies)		2,250,000
28	*To record cost of pies sold: $2,250,000 = 1,000,000 x $2.25.*		
29	Premium promotion program expense	765,000	
30	Premium promotion program - baking-pan inventory		765,000
31	*The 300,000 coupons actually redeemed this year resulted in 150,000 (300,000/2 coupons) baking-pans being sent to customers. $765,000 = 150,000 baking-pans x $5.10 purchase price per baking-pan.*		
32	Cash	390,000	
33	Premium promotion program expense		*390,000*
34	*$390,000 = 150,000 baking-pans x $2.60: $2.60 = $3.50 cash paid by a customer for each baking-pan redeemed less $0.90 cash cost of shipping a baking-pan to the customer.*		
35	Premium promotion program expense	500,000	
36	Premium promotion program liability		500,000
37	*This year-end adjusting entry records the premium promotion program liability at 31/12/20XX. The total estimated premium promotion program liability associated with the sale of 1,000,000 pies is $875,000 = [1,000,000 x 1 coupons issued]/[2 coupons required per baking-pan] x 70.00% estimated to be redeemed x [$5.10 + $0.90 - $3.50]. $500,000 = $875,000 less the $375,000 [= $765,000 - $390,000] premium promotion program expense already recorded in the above two journal entries.*		

QUESTION 2 (continued) (24 marks)
Answer ALL parts to this question. Each part is independent.

PART 2: (11 marks) (continued)

b) Prepare the journal entries that should be recorded in 20XX relative to the premium promotion program, assuming that Banff Ltd. follows IFRS 15's contract-based approach [sometimes called the 'revenue approach' when accounting for premium promotion programs].

74	Premium promotion program - baking-pan inventory	1,734,000	
75	Cash/payables		1,734,000
76	*To record purchase of premium promotion program - baking-pan inventory: $1,734,000 = 340,000 x $5.10.*		
77			
78	Cash	5,000,000	
79	Sales revenue (pies)		3,800,000
80	Unearned revenue (premium promotion program - baking-pans)		1,200,000
81	*To record (a) revenue earned from the sale of pies, and (b) unearned revenue from coupons for baking-pans. Of the $5.00 paid by a customer for each pie, $1.20 (or 24.0000% = $1.20/$5.00) is attributable to the premium promotion program -coupon. Thus, of the $5,000,000 [1,000,000 pies sold this year x $5.00 selling price per pie.], $1,200,000 (= 24.0000% x $5,000,000) is unearned revenue.*		
82			
83	Cost of goods sold (pies)	2,250,000	
84	Inventory (pies)		2,250,000
85	*To record cost of pies sold: $2,250,000 = 1,000,000 x $2.25.*		
86			
87	Unearned revenue (premium promotion program - baking-pans)	514,286	
88	Sales revenue (premium promotion program - baking-pans)		514,286
89	*To record revenue earned on 150,000 baking-pans exchanged for the 300,000 coupons redeemed this year. $514,286 = 42.857143% x $1,200,000. Remember that 150,000 baking-pans is 42.857143% of the estimated total of 350,000 baking-pans = [1,000,000 x 1/2coupons x 70.00%] to be redeemed and arising from this year's pie sales and is the 'pattern of rights exercised by the customer' (see also IFRS 15's paragraph B46 on the IFRS15-excerpt screen).*		
90			
91	Cash	390,000	
92	Cost of goods sold (premium promotion program)		390,000
93	*To record $390,000 = 150,000 baking-pans x $2.60: $2.60 = $3.50 cash paid by a customer for each baking-pan redeemed less $0.90 cash cost of shipping a baking-pan to the customer.*		
94			
95	Cost of goods sold (premium promotion program)	765,000	
96	Premium promotion program - baking-pan inventory		765,000
97	*To record the cost of the baking-pan-inventory redeemed by customers. $765,000 = 150,000 baking-pans x $5.10 purchase price per baking-pan.*		

QUESTION 2 (continued) (24 marks)
Answer ALL parts to this question. Each part is independent.

PART 3: (3 marks)

Define *liability*.

_____

_____

_____

_____

_____

IFRS and ASPE *currently* define a liability as

- **An obligation of an enterprise**
- **Arising from past transactions or events**
- **The settlement of which may result in the transfer or use of assets, provision of services, or other yielding of economic benefits in the future.**

PART 4 (6 marks)

Three independent situations follow.

Situation 1: During 2016, Rockland Inc. became involved in a tax dispute with the Canada Revenue Agency (CRA). Rockland's tax lawyers have informed management that Rockland will likely lose this dispute. They also believe that Rockland will have to pay the CRA between $900,000 and $1.4 million. After the 2016 financial statements were issued, the case was settled with the CRA for $1.2 million.

Required

What amount, if any, should be reported as a liability for this contingency as at December 31, 2016, assuming that Rockland follows ASPE? Briefly explain your answer.

The *CPA Canada Handbook for Private Enterprises section 3290* requires that, when some amount within the range appears at the time to be a better estimate than any other amount within the range, that amount be accrued. When no amount within the range is a better estimate than any other amount, the dollar amount at the low end of the range is accrued and the dollar amount of the high end of the range is disclosed. Since the information indicates that it is likely that a liability has been incurred at December 31, 2017, and a range of possible amounts can be reasonably determined, the criteria for recording a liability are met. In this case, therefore, Rockland Inc. would report a liability of $900,000 at December 31, 2017 and disclose the $1.4m.

Situation 2: Toward the end of Kanata Corp.'s 2017 fiscal year, employer-union talks broke off, with the wage rates for the upcoming two years still unresolved. Just before the new year, however, a contract was signed that gave employees a 5% increase in their hourly wage effective January 1, 2018. Kanata had spent $1.2 million in wages on this group of workers in 2017.

Required

Prepare the entry, if any, that Kanata Corp. should make at December 31, 2017. Briefly explain your answer.

Kanata Corp. would not be required to make any entry. The wage increase is for the coming two years and does not relate to the current or prior years.

QUESTION 2 (continued) (24 marks)
Answer ALL parts to this question. Each part is independent.

PART 4 (6 marks) (continued)

Situation 3: Orleans Inc. had a manufacturing plant in a foreign country that was destroyed in a civil war. It is not certain who will compensate Orleans for this destruction, but Orleans has been assured by that country's government officials that it will receive a definite amount, at least $25,000,000 for this plant. The compensation amount will be less than the plant's $35,000,000 fair value, but more than its $20,000,000 carrying amount.

Required
How should the contingency be reported in the financial statements of Orleans Inc. under ASPE?

This is a gain contingency because the amount to be received will be in excess of the carrying amount of the plant. Under both ASPE and IFRS [IAS 37.31-35], gain contingencies are not recorded and are disclosed in the notes only when the probabilities are high ["probable" under IAS 37.31-35] that a gain contingency will become a reality.

QUESTION 3 (32 marks)
Answer ALL parts to this question. Each part is independent.

PART 1: (10 marks)
On September 1, 2016 BondBeagle Inc. issues $1,000,000 face value bonds. The bond date is July 1, 2016, and the bonds carry a coupon rate of 6% per year, payable semi-annually on July 1 and January 1. The bonds' maturity date is July 1, 2036. The bonds provide an annual yield of 4%.

BondBeagle Inc. uses the effective interest rate method to amortize any bond premium or discount. BondBeagle Inc.'s accounting year-end is February 28.

Required (you must show all supporting calculations, including an audit trail if using a financial calculator)
Prepare all of the relevant journal entries to record the bond issuance.

This "date table' is not required in students' answers. Source: www.bondbeagle.com

BondBeagle: Accounting for the Life-Cycle Events of Non-Convertible Bond Liabilities

Reset Recalculate

Intro | INPUT | Text | Date_Tables | Issuance_Calc | Issuance | I1 | I2 | I3 | I4 | I5 | Retirement | R1 | R2 | R3 | R4 | R5

TABLE 1 ISSUANCE

Screen		
	July 1, 2016	The closest preceding interest payment date to the issuance date
	2	Number of months (rounded to the nearest whole month) between the issuance date and its closest preceding interest payment date.
Issuance	**September 1, 2016**	**Date of issuance**
	4	Number of months (rounded to the nearest month) between the date of issuance and its first following interest payment date
I1	January 1, 2017	The first interest payment date after the issuance date
	2	Number of months (rounded to the nearest month) between (a) the first interest payment date after the issuance date and (b) the first accounting year-end after the issuance date
I2	February 28, 2017	The first accounting year-end after the issuance date

Intro | INPUT | Text | Date_Tables | Issuance_Calc | Issuance | I1 | I2 | I3 | I4 | I5 | Retirement | R1 | R2 | R3 | R4

Face value	$1,000,000			
Stated interest rate	6.00%	per year = 3.0000% semi-annually.		
Effective interest rate (Yield)	2.00%	semi-annually.		
Issue date	September 1, 2016, 2 months after July 1, 2016, the closest preceding interest payment date.			
Maturity date	July 1, 2036, 6 months after January 1, 2036, the closest preceding interest payment date.			
Accrued interest payable on the issuance date			10,000.00	= $1,000,000 x 6.0000% x 2/12 months
Bond proceeds, excluding any accrued interest and issuance costs (see detailed calculation below)			1,272,045.50	= $1,273,554 + [($1,269,028 - $1,273,554) x 2/6 months]
Face value of bonds			1,000,000.00	
Bond premium			272,045.50	= $1,272,046 - $1,000,000
Total proceeds on issuance, including accrued interest payable			1,282,045.50	= $1,272,046 + $10,000
The closest preceding interest payment date to the issuance date is			July 1, 2016	(2 months before September 1, 2016)
Issuance date			September 1, 2016	
The first interest payment date after the issuance date is			January 1, 2017	(4 months after September 1, 2016)

QUESTION 3 (32 marks) (continued)
Answer ALL parts to this question. Each part is independent.

PART 1: (10 marks) (continued)

	If the bonds were issued on:	
	July 1, 2016	January 1, 2017
	There would be 40 semi-annual interest payments (240 months) between July 1, 2016 and the maturity date, July 1, 2036	There would be 39 semi-annual interest payments (234 months) between January 1, 2017 and the maturity date, July 1, 2036
Present value of the bond's 40.00 semi-annual interest payments of $30,000 (= $1,000,000 x 6.0000%/2) at 2.0000% effective interest rate [$820,664 = 27.35548 x $30,000]	820,664.40	
Present value of the maturity value of $1,000,000 at the end of 40.00 periods at 2.0000% effective interest rate [$452,890 = 0.45289 x $1,000,000]	452,890.00	
Present value of the bond's 39.00 semi-annual interest payments of $30,000 (= $1,000,000 x 6.0000%/2) at 2.0000% effective interest rate [$807,078 = 26.90259 x $30,000]		807,077.70
Present value of the maturity value of $1,000,000 at the end of 39.00 periods at 2.0000% effective interest rate [$461,950 = 0.46195 x $1,000,000]		461,950.00
Total	1,273,554.40	1,269,027.70
Bond proceeds, excluding any accrued interest and issuance cost, on September 01, 2016 (which lies between July 01, 2016 and January 01, 2017). $1,272,046 = $1,273,554 + {[($1,269,028 - $1,273,554)/6months] x 2months}	1,272,045.50	

Reset Recalculate

Intro | INPUT | Text | Date_Tables | Issuance_Calc | **Issuance** | I1 | I2 | I3 | I4 | I5 | Retirem

	B	C	D	E
2	September 01, 2016	Date of issuance	Dr	Cr
3				
4				
5	Cash		1,282,045.50	
6		Interest payable		10,000.00
7		Bonds payable		1,000,000.00
8		Bond premium		272,045.50
9				
10	To record the issuance of 20.00-year bonds, face value $1,000,000, stated interest rate 6.0000% per annum. The bond date is July 01, 2016 with interest paid semi-annually. There are 238 months (including 40 interest payments) between the bond's issuance and maturity dates. For details of how this journal entry's amounts are determined, please refer to the ISSUANCE_CALC sheet.			

QUESTION 3 (32 marks) (continued)
Answer ALL parts to this question. Each part is independent.

PART 2: (10 marks)

On March 1, 2016 BondBeagle Inc. issues $1,000,000 face value bonds. The bond date is March 1, 2016, and the bonds carry a coupon rate of 2% per year, payable semi-annually on March 1 and September 1. The bonds' maturity date is March 1, 2036. Proceeds upon issuance were $726,445, and the bonds provide an annual yield of 4%.

BondBeagle Inc. uses the effective interest rate method to amortize any bond premium or discount. On July 31, 2025 BondBeagle Inc. retires 30% of the bonds at 102.50%, excluding accrued interest. BondBeagle Inc.'s accounting year-end is May 31.

Required (you must show all supporting calculations, including an audit trail if using a financial calculator)

Present all necessary journal entries on the date of retirement.

TABLE 2 RETIREMENT

Screen		
	March 1, 2025	The closest preceding interest payment date to the retirement date
	3	Number of months (rounded to the nearest month) between (a) the closest preceding interest payment date to the retirement date and (b) the closest preceding accounting year-end date to the retirement date
	May 31, 2025	The closest preceding accounting year-end date to the retirement date
	2	Number of months (rounded to the nearest month) between (a) the closest preceding accounting year-end date to the retirement date and (b) the date of retirement
Retirement	**July 31, 2025**	**Date of retirement**
	1	Number of months (rounded to the nearest whole month) between the retirement date and the first interest payment date after the retirement date
R1	September 1, 2025	The first interest payment date after the retirement date
	6	Number of months (rounded to the nearest month) between (a) the first interest payment date after the retirement date and (b) the second interest payment date after the retirement date
R2	March 1, 2026	The second interest payment date after the retirement date

Carry amount at March 1, 2025 = $823,419 = PVA, 22 periods, 2%, $10k = $176,580 + PVA, 22 periods, 2%, $1m = 646,839

Intro | INPUT | Text | Date_Tables | Issuance_Calc | Issuance | I1 | I2 | I3 | I4 | I5 | Retirement | R1 | R2 | R3 | R4 | R5 | Maturity | Amor

Instructions:
Enter your data in the INPUT screen: all other screens are "Output screens".

	Date of retirement	Dr	Cr	
3	July 31, 2025			
4	Interest expense	1,646.84		= $823,419 (net bond liability at beginning of March 02, 2025) x 2.000000% (semi-annual yield) x 2/6 months x 30.0000% retired.
5	Bond discount		646.84	= $1,647 - $1,000
6	Interest payable		1,000.00	= $1,000,000 x 30.0000% retired x 2/12 months x 2.0000%
7				
	To record interest expense incurred on 30.0000% of the bonds between May 31, 2025 (the closest preceding accounting year-end date to the retirement date) and July 31, 2025. Effective interest rate method. [Note: July 31, 2025 is neither an accounting year-end or a bond interest payment anniversary date.]			

12	Loss on retirement	58,857.14		= ($310,000 - $2,500 + $51,357) - ($300,000)
13	Interest payable	2,500.00		= $1,000 (see above journal entry) + $1,500 (= $1,000,000 x 30.0000% retired x 3/12 months x 2.0000% accrued at May 31, 2025) March 01, 2025 is the closest preceding interest payment date to the date of retirement.
14	Bond payable	300,000.00		= $1,000,000 x 30.0000% retired
15	Bond discount		51,357.14	= $176,581 x 30.00% (unamortized at beginning of March 02, 2025) - $1,617 [$1,617 = ($823,419 x 2.000000% yield x 5/6 x 30.00%) - ($1,000,000 x 1.0000% interest paid x 5/6 x 30.00%) amortization, March 01, 2025 to July 31, 2025 on the 30.00% retired)]. March 01, 2025 is the closest preceding interest payment date to the date of retirement.
16				
17	Cash		310,000.00	= $307,500 (=$1,000,000 x 30.0000% x 102.5000%) + $1,000 accrued (as appears in the journal entry above) + $1,500 accrued at May 31, 2025
18				
19	To record the retirement at 102.5000% of 20.00 year 2.0000% bonds, issued March 01, 2016, face value $300,000.			

Use Ctrl+ and Ctrl- to zoom in and out.

QUESTION 3 (32 marks) (continued)
Answer ALL parts to this question. Each part is independent.

PART 3: (12 marks)

On January 1, 2013 Debtor Limited issued a 4 year 6.00% $1,000,000 bond payable to Creditor Bank. Interest payment dates are June 30 and December 31 and the bonds were issued to provide a semi-annual yield of 4.00%. By December 2015 Debtor Limited is in financial difficulties and is about to miss the December 31, 2015 interest payment. Debtor Limited negotiates an arrangement with Creditor Bank whereby Creditor Bank agrees to waive the December 31, 2015 interest payment and to replace, effective December 31, 2015, the above bond with a 4 year $1,398,032 face value bond bearing 8.00% annual interest, payable semi-annually. Due to Debtor Limited's precarious situation, lenders would normally seek a semi-annual return of 6.00% on this 'bail-out' financing.

Required (you must show all supporting calculations, including an audit trail when using a financial calculator)

(a) Is this troubled debt restructuring/exchange a *settlement* (substantially different in accordance with IFRS 9.3.3.2 and ASPE 3856.27) or a *modification* (not substantially different in accordance with IFRS 9.3.3.2 and ASPE 3856.27)? Support your answer with all necessary calculations. (6 marks)

(b) Assume this troubled debt restructuring is a *settlement*. Provide any journal entries for the *settlement* on Debtor Limited's books that may be necessary on December 31, 2015. Support your answer with all necessary calculations. (3 marks)

(c) Assume this troubled debt restructuring is a *modification*. Prepare Debtor Limited's journal entry necessary on June 30, 2016 for its liability to Creditor Bank. Support your answer with all necessary calculations. (3 marks)

(a)

Derecognition of financial liabilities through (i) an exchange with an existing lender or (ii) modification of terms, in accordance with IFRS 9 and Canadian ASPE.

Reset Recalculate

TDR | Steps1and2 | Step3_Substantial | Step3_NotSubstantial | IRR | IFRS_9 | ASPE_3856 | OtherApps

	A	B	C	D	E	F	G
1	Step 1:	Compare the new financing arrangement and the old financial liability using the old financial liability's original effective interest rate.					
2	Step 1(a):	Calculate the PV of the old 4 year bond at December 31, 2015, using the old bond's historic 4.00% semi-annual yield:					
3	PV Annuity, 2 semi-annual periods, 4.00%, $30,000:		$30,000	4.00%	2	1.886094675	$56,583
4	PV, 2 semi-annual periods, 4.00%, $1,000,000:		$1,000,000	4.00%	2	0.924556213	924,556
5							981,139
6	December 31, 2015 interest payable:						30,000
7	PV of the old financial liability owed at December 31, 2015, using its 4.00% original effective interest rate:						$1,011,139
8	The unamortized discount on the old financial liability:						$18,861
9							
10	Step 1(b)	Calculate the PV of the new 4 year financing arrangement at December 31, 2015, using the old bond's historic 4.00% semi-annual yield:					
11	PV Annuity, 8 semi-annual periods, 4.00%, $55,921:		$55,921	4.00%	8	6.732744875	$376,504
12	PV, 8 semi-annual periods, 4.00%, $1,398,032:		$1,398,032	4.00%	8	0.730690205	1,021,528
13	PV of the new financiing arrangement at December 31, 2015, using the old financial liability's 4.00% original effective interest rate:						$1,398,032
14							
15	Step 2:	Apply the '10%' test to determine if the old financial liability and the new financial arrangement differ SUBSTANTIALLY from one another.					
16	Difference ($1,011,139 - $1,398,032):						$386,893
17	Difference as a percentage of $1,011,139:						38.26%
18							
19	Conclusion: in accordance with IFRS 9.3.3.2, IFRS 9.B3.3.6, ASPE 3856.27, and ASPE 3856.A52 because the difference as a percentage of $1,011,139 is at least 10% (i) the old financial liability must be derecognized, (ii) a new financial liability recognized, and (iii) a gain/loss recorded.						

(b)

TDR | Steps1and2 | Step3_Substantial | Step3_NotSubstantial | IRR | IFRS_9 | ASPE_3856 | OtherApps

	A	B	C	D	E	F	G
1	Step 3: when Step 2's 'difference' is SUBSTANTIAL [i.e., is at least 10% (this type of financial arrangement is called a 'settlement' by some textbooks)] and therefore, in accordance with IFRS 9.3.3.2 and ASPE 3856.27, requires (i) derecognition of the old financial liability, (ii) recognition of a new financial liability, and (iii) recognition of any gain/loss on the transaction.						
2	Step 3(a): calculate the PV of the new 4 year financial arrangement at 31/12/2015, using the prevailing 6.00% semi-annual effective interest rate for financial liabilities with similar risk & maturity.						
3	PV Annuity, 8 semi-annual periods, 6.00%, $55,921:		$55,921	6.00%	8	6.209793811	$347,260
4	PV, 8 semi-annual periods, 6.00%, $1,398,032:		$1,398,032	6.00%	8	0.627412371	877,143
5	PV of the new bond:						$1,224,402
6	Face value of the new 4 year bond:						1,398,032
7	Therefore, the discount on the (new) bond is:						$173,630
8							
9	Step 3(b): record the 31/12/2015 journal entry required to (i) derecognize the old financial liability, (ii) recognize a new financial liability, and (iii) recognize any gain/loss on the transaction:						
10				Dr	Cr		
11	(Old) Bond payable			1,000,000			
12		(Old) Bond discount			18,861	[=$1,000,000 - $981,139].	
13	Interest payable (on Old Bond)			30,000			
14	(New) Bond discount			173,630			
15		(New) Bond payable			1,398,032		
16	Loss on bond restructuring			213,263		[= $1,011,139 - $1,224,402].	

QUESTION 3 (32 marks) (continued)
Answer ALL parts to this question. Each part is independent.

PART 3: (12 marks) (continued)

(c)

TDR | Steps1and2 | Step3_Substantial | **Step3_NotSubstantial** | IRR | IFRS_9 | ASPE_3856 | OtherApps

	A	B	C	D	E	F	G
1	Step 3: when Step 2's 'difference' is NOT-SUBSTANTIAL [i.e., is less than 10% (this type of financial arrangement is called a 'modification' by some textbooks)] and therefore, in accordance with IFRS 9.3.3.2 and ASPE 3856.27, does not result in the derecognition of the old financial liability or recognition of a new financial liability.						
2	Step 3(a): calculate the effective interest rate (yield, discount rate, market-rate, IRR) implicit in the terms of the new financial arrangement, taking into consideration the $1,011,139 pre-restructuring carrying amount (book value) of the old financial liability:						
3	Find the semi-annual rate which equates the PV of the new financial arrangement with the the above-calculated $1,011,139 PV of the old financial liability.						
4	PVA, 8 semi-annual periods, ?%, $55,921:		$55,921	8	9.000003729%		$309,514
5	PV, 8 semi-annual periods, ?%, $1,398,032:		$1,398,032	8	9.000003729%		701,625
6	PV of the new bond:						$1,011,139
7	Thus, ?% = 9.000003729%: this is the effective interest rate and is calculated using (i) 'interpolation', (ii) a spreadsheet's functionality such as MS Excel's (a) GOAL SEEK or (b) the '=IRR(values,guess)' function (see the IRR sheet in this application), or (iii) a financial calculator.						

30/06/2015

Interest expense…… 91,003

Bond discount [or Bond payable]…… 35,081

Cash…… 55,921

The following tables are not required in your solution.

	A	B	C	D	E	F	G
9	Step 3(b): using this effective interest rate, prepare a table that amortizes the pre-restructuring unamortized cost of the existing financial liability to the maturity value of the new financial arrangement:						
10	The amortization table below proves that the above calculation of 9.000003729% per 6-months is correct (see also the IRR sheet in this application). Use this table to assist you when recording interest expense during the new financial arrangement's life.						
11	Beginning of period	Face value of the financial liability	Unamortized premium (discount) on the financial liability	Beginning of period amortized cost of the financial liability	CREDIT: 4.00% interest paid per 6 months.	DEBIT: 9.000003729% interest expense per 6 months.	CREDIT amortized cost of the financial liability
12	31-Dec-15	1,030,000	-18,861	1,011,139	55,921	91,003	35,081
13	30-Jun-16	1,030,000	16,220	1,046,220	55,921	94,160	38,239
14	31-Dec-16	1,030,000	54,459	1,084,459	55,921	97,601	41,680
15	30-Jun-17	1,030,000	96,139	1,126,139	55,921	101,353	45,431
16	31-Dec-17	1,030,000	141,570	1,171,570	55,921	105,441	49,520
17	30-Jun-18	1,030,000	191,090	1,221,090	55,921	109,898	53,977
18	31-Dec-18	1,030,000	245,067	1,275,067	55,921	114,756	58,835
19	30-Jun-19	1,030,000	303,902	1,333,902	55,921	120,051	64,130

If using Professor Burnage's "yield/effective interest rate approximation formula":

I	$55,921	
P	$1,398,032	
M	$1,011,139	
N	8	six semi-annual periods
Y	8.6571377%	per semi-annual period
Y	=(I+(P–M)/N)/((P+M)/2)	

30/06/2015

Interest expense…($1,011,139 x 8.6571377%)…… 87,536

Bond discount [or Bond payable]…… 31,615

Cash…… 55,921

QUESTION 4 (19 marks)

Answer ALL parts to this question. Each part is independent.

PART 1: (4 marks)

Required

Complete the following table for the share issuance transactions #2 to #5 for a company that follows IFRS. #1 is provided as an example.

	Issue shares in exchange for:	**Measure the transaction at the:**
1 (example)	cash	amount of cash received.
2	the settlement of a liability	
3	services received from employees	
4	non-cash assets received	
5	services received from outsiders (non-employees)	

	Issue shares in exchange for:	**Measure the transaction at the:**
1	cash	amount of cash received.
2	the settlement of a liability	FV of the shares issued. [IFRIC 19]
3	services received from employees	FV of the shares issued. [IFRS 2.11 & ASPE 3870.24]
4	non-cash assets received	FV of the non-cash assets received. [IFRS 2.10; ASPE 3870.09]
5	services received from outsiders (non-employees)	FV of the services received. [IFRS 2.10] FV fair value of the services received, or the fair value of the equity instruments, whichever is more reliably measurable. [ASPE 3870.09]*
	*ASPE 3870.11: if the shares are tradeable use this value. Otherwise use the more reliable of (i) the FV of the shares or (ii) the FV of the services received.	

Note: the ASPE information is not required in students' answers and is provided for educational purposes only.

Question 4 (19 marks) (continued)
Answer ALL parts to this question. Each part is independent.

PART 2: (6 marks)

Afridi Corporation's last year-end balance sheet reported the following in its shareholders' equity section:

Common shares, no par, outstanding 5,000 shares	$115,000
Retained earnings	200,000

The following transactions occurred this year:
(a) Purchased 70 common shares at $30 per share, to be held as treasury shares.
(b) Sold 10 of the treasury shares at $16 per share.
(c) Sold the remaining treasury shares at $32 per share.

Required

Prepare Afridi Corporation's journal entries for these transactions.

(a)	**Treasury Shares (70 x $30).....**	**2,100**	
	Cash		**2,100**
(b)	**Cash (10 x $16) .....**	**160**	
	Retained Earnings……..	**140**	
	Treasury Shares (10 x $30).....		**300**
(c)	**Cash (60 x $32) .....**	**1,920**	
	Treasury Shares (60 x $30).....		**1,800**
	Contributed Surplus……..		**120**

Question 4 (19 marks) (continued)
Answer ALL parts to this question. Each part is independent.

PART 3: (9 marks)

Warner Corp. reported the following amounts in the shareholders' equity section of its December 31, 2016 statement of financial position:

Preferred shares, $8 dividend (10,000 shares authorized, 2,000 shares issued)	$200,000
Common shares (unlimited shares authorized, 25,000 issued)	100,000
Contributed surplus	155,000
Retained earnings	250,000
Accumulated other comprehensive income	75,000
Total	$780,000

During 2017, the company had the following transactions that affect shareholders' equity.

1. January 4, 2017: Paid the annual 2016 $8 per share dividend on preferred shares and a $3 per share dividend on common shares. These dividends had been declared on December 31, 2016.
2. February 12, 2017: Purchased 3,700 shares of its own outstanding common shares for $35 per share and cancelled them.
3. January 1, 2017: Issued 1,000 preferred shares at $105 per share.
4. June 12, 2017: Declared a 10% stock dividend on the outstanding common shares when the shares were selling for $45 per share.
5. July 12, 2017: Issued the stock dividend.
6. December 14, 2017: Declared the annual 2017 $8 per share dividend on preferred shares and a $2 per share dividend on common shares. These dividends are payable in 2018.

The $155,000 contributed surplus arose from net excess of proceeds over cost on a previous cancellation of common shares. Total assets at December 31, 2016, were $940,000, and total assets at December 31, 2017, were $916,000. The company follows IFRS.

Required

Prepare journal entries to record the transactions above.

1.	**Dividends Payable**		
	(Preferred - 2,000 X $8)	**16,000**	
	Dividends Payable		
	(Common - 25,000 X $3)	**75,000**	
	Cash		**91,000**
2.	**Common Shares**	**14,800**	
	Contributed Surplus (common)	**114,700**	
	Cash (3,700 X $35)		**129,500**
	($100,000 / 25,000 X 3,700 = $14,800)		
3.	**Cash (1,000 X $105)**	**105,000**	
	Preferred Shares		**105,000**
4.	**Retained Earnings**	**95,850**	
	Common Stock Dividends Distributable		**95,850**
	[(25,000 – 3,700) X 10% = 2,130 X $45]		
5.	**Common Stock Dividends Distributable**	**95,850**	
	Common Shares		**95,850**
6.	**Retained Earnings**	**70,860**	
	Dividends Payable (Preferred - 3,000 X $8)		**24,000**
	Dividends Payable [(Common - 25,000 – 3,700 + 2,130) X $2]		**46,860**

Question 5 (8 marks)

On January 1, 2016, Organic Juice Ltd. entered into a purchase commitment contract to buy 10,000 lemons from a local company at a price of $0.50 per lemon anytime during the next year. The contract provides Organic Juice with the option either to take delivery of the lemons at any time over the next year, or to settle the contract on a net basis for the difference between the agreed-upon price of $0.50 per lemon and the market price per lemon for any lemons that have not been delivered. As at January 31, 2016, Organic Juice Ltd. did not take delivery of any lemon, and the market price for lemon was $0.52 each. As at February 28, 2016, Organic Juice Ltd. did not take delivery of any lemons, and the market price for lemons was $0.47 each.

(a) Assuming that Organic Juice Ltd. follows IFRS, how should Organic Juice Ltd. account for this purchase agreement if it fully intends to take delivery of all 10,000 lemons over the next year? Provide any required journal entries at January 1, January 31 and February 28 *and* explain your answer.

(b) How would your answer to part (a) change if Organic Juice Ltd. did not intend to take delivery of the lemon? Provide any required journal entries at January 1, January 31, and February 28 *and* explain your answer.

(c) Assuming that Organic Juice Ltd. follows ASPE, how would Organic Juice Ltd. account for this purchase agreement at January 1, January 31, and February 28 if it did not intend to take delivery of all 10,000 lemons over the next year? Provide any required journal entries at January 1, January 31, and February 28 *and* explain your answer.

(a) Under IFRS, this purchase commitment is an executory contract that can be settled on a net basis by paying cash as opposed to taking delivery of the lemons. However, because Organic Juice fully intends to take delivery of the lemons, the contract is designated (under both IFRS & ASPE) as 'expected use' and not accounted for as a derivative; rather, the contract is not recognized until delivery of the lemons takes place.

Therefore, there are no journal entries required at either January 1, January 31 or February 28. A journal entry will be recorded when Organic Juice actually takes delivery of lemons.

(b) If Organic Juice does not intend to take delivery of the lemons, then the executory contract will be viewed as a derivative because it can be settled on a net basis. Therefore, the contract would be recorded at fair value.

Because there was no cost to enter into the contract, there would be no initial entry on January 1.

However, the contract will be marked to market and will change as the price of lemons change. Therefore the following journal entries will be made on January 31 and February 28:

31/1/2016

Derivatives–Financial Assets/Liabilities [underlying = lemons]	**200**	
Gain (10,000 X (0.52 – 0.50))		**200**

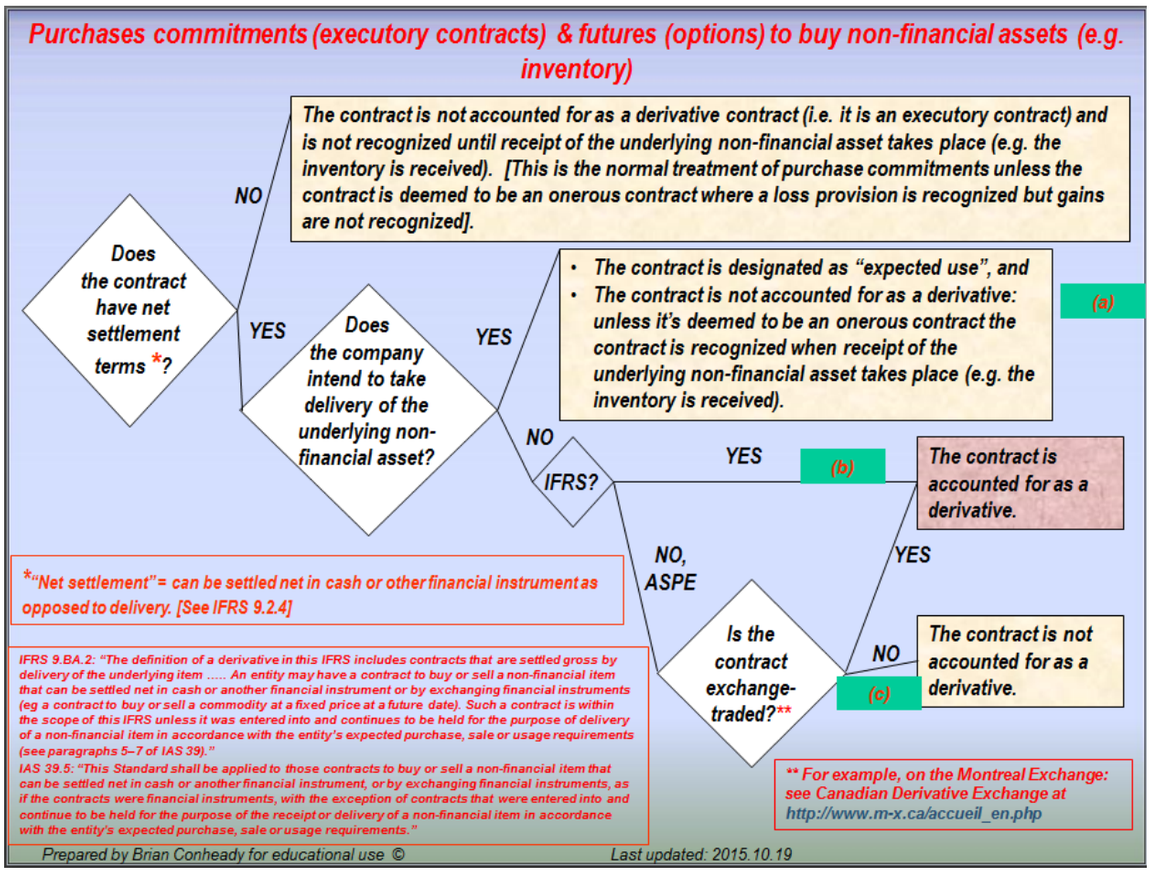
28/2/2016

Loss (10,000 X (0.52 – 0.47))	**500**	
Derivatives–Financial Assets/Liabilities [underlying = lemons]		**500**

(c) Under ASPE, despite the fact that Organic Juice does not intend to take delivery of the lemons, this purchase commitment contract would not be accounted for as a derivative because this agreement is not exchange traded. Therefore, the contract would not be recognized until delivery of lemon takes place or if/when the contract is deemed *onerous.*

Therefore, there are no journal entries required at either January 1, January 31 or February 28. A journal entry will be recorded when Organic Juice actually takes delivery of lemons or if/when the contract is deemed *onerous.*

Question 5 (10 marks) (continued)



Financial Tables

Table 2: PRESENT VALUE of $1.00 that is received in the future.

Period /Percent	-2%	-1%	0%	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%
1	1.0204082	1.0101010	1.0000000	0.9900990	0.9803922	0.9708738	0.9615385	0.9523810	0.9433962	0.9345794	0.9259259	0.9174312	0.9090909
2	1.0412328	1.0203041	1.0000000	0.9802960	0.9611688	0.9425959	0.9245562	0.9070295	0.8899964	0.8734387	0.8573388	0.8416800	0.8264463
3	1.0624825	1.0306102	1.0000000	0.9705901	0.9423223	0.9151417	0.8889964	0.8638376	0.8396193	0.8162979	0.7938322	0.7721835	0.7513148
4	1.0841658	1.0410204	1.0000000	0.9609803	0.9238454	0.8884870	0.8548042	0.8227025	0.7920937	0.7628952	0.7350299	0.7084252	0.6830135
5	1.1062916	1.0515357	1.0000000	0.9514657	0.9057308	0.8626088	0.8219271	0.7835262	0.7472582	0.7129862	0.6805832	0.6499314	0.6209213
6	1.1288690	1.0621573	1.0000000	0.9420452	0.8879714	0.8374843	0.7903145	0.7462154	0.7049605	0.6663422	0.6301696	0.5962673	0.5644739
7	1.1519071	1.0728861	1.0000000	0.9327181	0.8705602	0.8130915	0.7599178	0.7106813	0.6650571	0.6227497	0.5834904	0.5470342	0.5131581
8	1.1754154	1.0837234	1.0000000	0.9234832	0.8534904	0.7894092	0.7306902	0.6768394	0.6274124	0.5820091	0.5402689	0.5018663	0.4665074
9	1.1994035	1.0946701	1.0000000	0.9143398	0.8367553	0.7664167	0.7025867	0.6446089	0.5918985	0.5439337	0.5002490	0.4604278	0.4240976
10	1.2238811	1.1057274	1.0000000	0.9052870	0.8203483	0.7440939	0.6755642	0.6139133	0.5583948	0.5083493	0.4631935	0.4224108	0.3855433
11	1.2488583	1.1168963	1.0000000	0.8963237	0.8042630	0.7224213	0.6495809	0.5846793	0.5267875	0.4750928	0.4288829	0.3875329	0.3504939
12	1.2743452	1.1281781	1.0000000	0.8874492	0.7884932	0.7013799	0.6245970	0.5568374	0.4969694	0.4440120	0.3971138	0.3555347	0.3186308
13	1.3003523	1.1395738	1.0000000	0.8786626	0.7730325	0.6809513	0.6005741	0.5303214	0.4688390	0.4149644	0.3676979	0.3261786	0.2896644
14	1.3268901	1.1510847	1.0000000	0.8699630	0.7578750	0.6611178	0.5774751	0.5050680	0.4423010	0.3878172	0.3404610	0.2992465	0.2633313
15	1.3539694	1.1627118	1.0000000	0.8613495	0.7430147	0.6418619	0.5552645	0.4810171	0.4172651	0.3624460	0.3152417	0.2745380	0.2393920
16	1.3816015	1.1744564	1.0000000	0.8528213	0.7284458	0.6231669	0.5339082	0.4581115	0.3936463	0.3387346	0.2918905	0.2518698	0.2176291
17	1.4097974	1.1863196	1.0000000	0.8443775	0.7141626	0.6050164	0.5133732	0.4362967	0.3713644	0.3165744	0.2702690	0.2310732	0.1978447
18	1.4385688	1.1983026	1.0000000	0.8360173	0.7001594	0.5873946	0.4936281	0.4155207	0.3503438	0.2958639	0.2502490	0.2119937	0.1798588
19	1.4679273	1.2104067	1.0000000	0.8277399	0.6864308	0.5702860	0.4746424	0.3957340	0.3305130	0.2765083	0.2317121	0.1944897	0.1635080
20	1.4978850	1.2226330	1.0000000	0.8195445	0.6729713	0.5536758	0.4563869	0.3768895	0.3118047	0.2584190	0.2145482	0.1784309	0.1486436
21	1.5284541	1.2349828	1.0000000	0.8114302	0.6597758	0.5375493	0.4388336	0.3589424	0.2941554	0.2415131	0.1986557	0.1636981	0.1351306
22	1.5596471	1.2474574	1.0000000	0.8033962	0.6468390	0.5218925	0.4219554	0.3418499	0.2775051	0.2257132	0.1839405	0.1501817	0.1228460
23	1.5914766	1.2600580	1.0000000	0.7954418	0.6341559	0.5066917	0.4057263	0.3255713	0.2617973	0.2109469	0.1703153	0.1377814	0.1116782
24	1.6239557	1.2727858	1.0000000	0.7875661	0.6217215	0.4919337	0.3901215	0.3100679	0.2469785	0.1971466	0.1576993	0.1264049	0.1015256
25	1.6570977	1.2856422	1.0000000	0.7797684	0.6095309	0.4776056	0.3751168	0.2953028	0.2329986	0.1842492	0.1460179	0.1159678	0.0922960
26	1.6909160	1.2986285	1.0000000	0.7720480	0.5975793	0.4636947	0.3606892	0.2812407	0.2198100	0.1721955	0.1352018	0.1063925	0.0839055
27	1.7254245	1.3117460	1.0000000	0.7644039	0.5858620	0.4501891	0.3468166	0.2678483	0.2073680	0.1609304	0.1251868	0.0976078	0.0762777
28	1.7606372	1.3249960	1.0000000	0.7568356	0.5743746	0.4370768	0.3334775	0.2550936	0.1956301	0.1504022	0.1159137	0.0895484	0.0693433
29	1.7965686	1.3383797	1.0000000	0.7493421	0.5631123	0.4243464	0.3206514	0.2429463	0.1845567	0.1405628	0.1073275	0.0821545	0.0630394
30	1.8332333	1.3518987	1.0000000	0.7419229	0.5520709	0.4119868	0.3083187	0.2313774	0.1741101	0.1313671	0.0993773	0.0753711	0.0573086
31	1.8706462	1.3655543	1.0000000	0.7345771	0.5412460	0.3999871	0.2964603	0.2203595	0.1642548	0.1227730	0.0920160	0.0691478	0.0520987
32	1.9088226	1.3793478	1.0000000	0.7273041	0.5306333	0.3883370	0.2850579	0.2098662	0.1549574	0.1147411	0.0852000	0.0634384	0.0473624
33	1.9477782	1.3932806	1.0000000	0.7201031	0.5202287	0.3770262	0.2740942	0.1998725	0.1461862	0.1072347	0.0788889	0.0582003	0.0430568
34	1.9875288	1.4073541	1.0000000	0.7129733	0.5100282	0.3660449	0.2635521	0.1903548	0.1379115	0.1002193	0.0730453	0.0533948	0.0391425
35	2.0280906	1.4215698	1.0000000	0.7059142	0.5000276	0.3553834	0.2534155	0.1812903	0.1301052	0.0936629	0.0676345	0.0489861	0.0355841
36	2.0694802	1.4359291	1.0000000	0.6989249	0.4902232	0.3450324	0.2436687	0.1726574	0.1227408	0.0875355	0.0626246	0.0449413	0.0323492
37	2.1117145	1.4504334	1.0000000	0.6920049	0.4806109	0.3349829	0.2342968	0.1644356	0.1157932	0.0818088	0.0579857	0.0412306	0.0294083
38	2.1548107	1.4650843	1.0000000	0.6851534	0.4711872	0.3252262	0.2252854	0.1566054	0.1092389	0.0764569	0.0536905	0.0378262	0.0267349
39	2.1987864	1.4798831	1.0000000	0.6783697	0.4619482	0.3157535	0.2166206	0.1491480	0.1030555	0.0714550	0.0497134	0.0347030	0.0243044
40	2.2436596	1.4948314	1.0000000	0.6716531	0.4528904	0.3065568	0.2082890	0.1420457	0.0972222	0.0667804	0.0460309	0.0318376	0.0220949

Table 4: PRESENT VALUE of Annuity of $1.00 in arrears.

Period/Percent	-2%	-1%	0%	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%
1	1.020408	1.010101	1.000000	0.990099	0.980392	0.970874	0.961538	0.952381	0.943396	0.934579	0.925926	0.917431	0.909091
2	2.061641	2.030405	2.000000	1.970395	1.941561	1.913470	1.886095	1.859410	1.833393	1.808018	1.783265	1.759111	1.735537
3	3.124123	3.061015	3.000000	2.940985	2.883883	2.828611	2.775091	2.723248	2.673012	2.624316	2.577097	2.531295	2.486852
4	4.208289	4.102036	4.000000	3.901966	3.807729	3.717098	3.629895	3.545951	3.465106	3.387211	3.312127	3.239720	3.169865
5	5.314581	5.153571	5.000000	4.853431	4.713460	4.579707	4.451822	4.329477	4.212364	4.100197	3.992710	3.889651	3.790787
6	6.443450	6.215729	6.000000	5.795476	5.601431	5.417191	5.242137	5.075692	4.917324	4.766540	4.622880	4.485919	4.355261
7	7.595357	7.288615	7.000000	6.728195	6.471991	6.230283	6.002055	5.786373	5.582381	5.389289	5.206370	5.032953	4.868419
8	8.770772	8.372338	8.000000	7.651678	7.325481	7.019692	6.732745	6.463213	6.209794	5.971299	5.746639	5.534819	5.334926
9	9.970176	9.467008	9.000000	8.566018	8.162237	7.786109	7.435332	7.107822	6.801692	6.515232	6.246888	5.995247	5.759024
10	11.194057	10.572736	10.000000	9.471305	8.982585	8.530203	8.110896	7.721735	7.360087	7.023582	6.710081	6.417658	6.144567
11	12.442915	11.689632	11.000000	10.367628	9.786848	9.252624	8.760477	8.306414	7.886875	7.498674	7.138964	6.805191	6.495061
12	13.717261	12.817810	12.000000	11.255077	10.575341	9.954004	9.385074	8.863252	8.383844	7.942686	7.536078	7.160725	6.813692
13	15.017613	13.957384	13.000000	12.133740	11.348374	10.634955	9.985648	9.393573	8.852683	8.357651	7.903776	7.486904	7.103356
14	16.344503	15.108468	14.000000	13.003703	12.106249	11.296073	10.563123	9.898641	9.294984	8.745468	8.244237	7.786150	7.366687
15	17.698472	16.271180	15.000000	13.865053	12.849264	11.937935	11.118387	10.379658	9.712249	9.107914	8.559479	8.060688	7.606080
16	19.080074	17.445637	16.000000	14.717874	13.577709	12.561102	11.652296	10.837770	10.105895	9.446649	8.851369	8.312558	7.823709
17	20.489871	18.631956	17.000000	15.562251	14.291872	13.166118	12.165669	11.274066	10.477260	9.763223	9.121638	8.543631	8.021553
18	21.928440	19.830259	18.000000	16.398269	14.992031	13.753513	12.659297	11.689587	10.827603	10.059087	9.371887	8.755625	8.201412
19	23.396367	21.040665	19.000000	17.226008	15.678462	14.323799	13.133939	12.085321	11.158116	10.335595	9.603599	8.950115	8.364920
20	24.894252	22.263298	20.000000	18.045553	16.351433	14.877475	13.590326	12.462210	11.469921	10.594014	9.818147	9.128546	8.513564
21	26.422707	23.498281	21.000000	18.856983	17.011209	15.415024	14.029160	12.821153	11.764077	10.835527	10.016803	9.292244	8.648694
22	27.982354	24.745739	22.000000	19.660379	17.658048	15.936917	14.451115	13.163003	12.041582	11.061240	10.200744	9.442425	8.771540
23	29.573830	26.005797	23.000000	20.455821	18.292204	16.443608	14.856842	13.488574	12.303379	11.272187	10.371059	9.580207	8.883218
24	31.197786	27.278582	24.000000	21.243387	18.913926	16.935542	15.246963	13.798642	12.550358	11.469334	10.528758	9.706612	8.984744
25	32.854884	28.564225	25.000000	22.023156	19.523456	17.413148	15.622080	14.093945	12.783356	11.653583	10.674776	9.822580	9.077040
26	34.545800	29.862853	26.000000	22.795204	20.121036	17.876842	15.982769	14.375185	13.003166	11.825779	10.809978	9.928972	9.160945
27	36.271224	31.174599	27.000000	23.559608	20.706898	18.327031	16.329586	14.643034	13.210534	11.986709	10.935165	10.026580	9.237223
28	38.031861	32.499595	28.000000	24.316443	21.281272	18.764108	16.663063	14.898127	13.406164	12.137111	11.051078	10.116128	9.306567
29	39.828430	33.837975	29.000000	25.065785	21.844385	19.188455	16.983715	15.141074	13.590721	12.277674	11.158406	10.198283	9.369606
30	41.661663	35.189874	30.000000	25.807708	22.396456	19.600441	17.292033	15.372451	13.764831	12.409041	11.257783	10.273654	9.426914
31	43.532309	36.555428	31.000000	26.542285	22.937702	20.000428	17.588494	15.592811	13.929086	12.531814	11.349799	10.342802	9.479013
32	45.441132	37.934776	32.000000	27.269589	23.468335	20.388766	17.873551	15.802677	14.084043	12.646555	11.434999	10.406240	9.526376
33	47.388910	39.328056	33.000000	27.989693	23.988564	20.765792	18.147646	16.002549	14.230230	12.753790	11.513888	10.464441	9.569432
34	49.376439	40.735410	34.000000	28.702666	24.498592	21.131837	18.411198	16.192904	14.368141	12.854009	11.586934	10.517835	9.608575
35	51.404530	42.156980	35.000000	29.408580	24.998619	21.487220	18.664613	16.374194	14.498246	12.947672	11.654568	10.566821	9.644159
36	53.474010	43.592909	36.000000	30.107505	25.488842	21.832252	18.908282	16.546852	14.620987	13.035208	11.717193	10.611763	9.676508
37	55.585724	45.043343	37.000000	30.799510	25.969453	22.167235	19.142579	16.711287	14.736780	13.117017	11.775179	10.652993	9.705917
38	57.740535	46.508427	38.000000	31.484663	26.440641	22.492462	19.367864	16.867893	14.846019	13.193473	11.828869	10.690820	9.732651
39	59.939321	47.988310	39.000000	32.163033	26.902589	22.808215	19.584485	17.017041	14.949075	13.264928	11.878582	10.725523	9.756956
40	62.182981	49.483141	40.000000	32.834686	27.355479	23.114772	19.792774	17.159086	15.046297	13.331709	11.924613	10.757360	9.779051

CALCULATING THE EFFECTIVE INTEREST RATE © effective.doc
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The formula shown below will ***approximate*** the effective ~~annual~~ **periodic*** yield (interest rate) of an investment/debt where there are periodic receipts/payments of interest and a final lump-sum receipt/payment where the initial amount invested/borrowed isn't equal to the final lump-sum receipt/payment.

Y = [I + (P – M) / N] /[(P + M) / 2]

Where: Y = Effective ~~annual~~ **periodic*** yield (rate)
N = Number of periods of compounding in total
M = Amount paid/received at date of purchase/sale
P = Face/Maturity value (final lump-sum payment)
I = Amount of income received/paid per compounding period

*** "annual" in the original has been changed to "periodic": Professor Conheady, 2016.10.10**

Source (viewed 2016 10 06):
http://wserver.scc.losrios.edu/~burbagg/effective.pdf