Midterm 2020, questions and answers

Finance 2 (Wilfrid Laurier University)

WILFRID LAURIER UNIVERSITY
WATERLOO, ONTARIO

Version A

Session: Winter 2020 Midterm Exam
Course No.: BU393
Title: Financial Management II
Professor(s): Amjad, Freire
Number of pages: 14
Length of examination: 2 hours
Examination aids allowed: Calculator

Name: _____

I.D. # _____

Section: _____

The doors of the examination room will be opened approximately 10 minutes before the start of the examination. Candidates will be permitted to enter the examination room quietly up to one half hour after the scheduled start of the exam. Candidates arriving late will not be allowed any extra time.

*Candidates must **not begin** the examination or attempt to read the examination questions **until instructed** to do so.*

***THE UNIVERSITY IS NOT RESPONSIBLE FOR THE LOSS OF VALUABLES BROUGHT INTO THE EXAM LOCATIONS OR CLASSROOMS WHERE EXAMS ARE BEING WRITTEN.*

*Candidates once having entered, may **not leave** the exam room before completing and submitting the exam **unless accompanied by a Proctor**. Candidates are **not** permitted to submit their examination and **leave the examination room until 1 hour** after the examination has begun, and in no case before their attendance has been taken. In no case may a candidate leave the room temporarily, for any reason, until 30 minutes after the start of the examination. In order that remaining candidates are not disrupted, candidates must remain seated and may not leave the examination room during the last 15 minutes of the examination session.*

*At the close of the examination period, candidates must stop writing immediately. The Presiding Officer may seize the papers of candidates who fail to observe this requirement, and a penalty may be imposed at the discretion of the instructor. Candidates must **submit all their work**, according to the instructions of the Presiding Officer, including all materials and a copy of the examination paper with their name and student ID number written on it. Unused examination booklets may not be taken from the examination room.*

A candidate who leaves before the examination is over must hand in all completed and attempted work, notes made during the exam, and a copy of the examination paper with their name and student ID number on it.

*Talk or any form of **communication between candidates** is absolutely **forbidden**. No information of any kind is to be written on the question paper or on scrap paper for the purpose of assisting other candidates. Responses to questions must not be done in an exaggerated way or in a manner that will involve transmission of information to others.*

*Candidates must remain seated during the examination period. A candidate needing to speak to the proctor (e.g. to ask for additional supplies or to request permission to leave the examination room for any reason) should so indicate by **raising** his or her **hand**.*

Questions concerning possible errors, ambiguities or omissions in the examination paper must be directed to the proctor who will investigate them through the proper channels. The proctor is not permitted to answer questions other than those concerning the examination paper.

*Candidates must **not use** or attempt to use any **improper source of information**. No candidates for an examination may bring into the examination room any books, notes or other material containing information pertaining to the examination unless the examiner has given instructions that such material will be allowed and this instruction is specified on the examination paper. Any item brought into the examination room is subject to inspection.*

No briefcases, backpacks or other bags and carriers may be brought to the desk site where the candidate is writing the examination. These bags should be left outside the examination room. If books, notes etc. cannot be left outside the examination room, they must be put at the front of the examination room in a place designated by the proctor before a candidate takes a seat. Candidates are advised not to bring valuables to the examination room.

***No electronic or communication devices will be allowed** in the examination room, including cell phones, smartphones, pagers, etc. Cell phones will be taken away if found and an Irregularity notice will be filed with the Integrity Office. Calculators are not allowed unless specified by the instructor and indicated on the examination paper. **Only non-programmable calculators without lids,** authorized by the instructor, will be allowed. It is the candidate's responsibility to ascertain whether the use of calculators is permitted, and, if it is, whether any restrictions are imposed on the types of calculators that may be brought to the examination.*

No pencil cases are allowed on the desks.

*Translation **dictionaries** (e.g. English-French) or other dictionaries, (thesaurus, definitions, technical) **are not allowed unless specified** by the instructor and indicated on the examination paper. Electronic dictionaries are never allowed.*

***Except for bottled water (with label removed), no food or drink** is allowed in the examination room. Candidates with health problems that warrant relaxation of this regulation should provide medical documentation to the presiding officer prior to the beginning of the examination. Such students should restrict themselves to those items and packaging that will least distract other examinees.*

*Candidates are expected to write their examinations in an honest and straightforward manner. Where there are reasonable grounds for believing a **violation of exam protocol** has occurred, the candidate will be **subject to the disciplinary procedures** and sanctions according to the University Calendar.*

Only currently registered students will be permitted to write the final exam. Examinations conducted at Wilfrid Laurier University will be bound by WLU regulations, regardless of where the candidate is registered. ***Approved by Senate (Oct 27/Year 3) Updated January 2014***

ADDITIONAL INSTRUCTIONS

BEFORE THE EXAM

1. Complete the personal identification portion of the multiple choice answer card. Shade in the boxes below your student number on BOTH sides of the Scantron card.

2. Your student number should be left-aligned in the field.
3. Make sure that you shade the version of your exam under "Test Form".

DURING THE EXAM

4. Count the pages to be certain that there are no missing pages.

5. **No** questions will be answered by the proctors or the Instructors during the exam, except in the case of missing pages.

6. If, for any reason, you think that the correct answer is missing from the multiple choices, then select the best available answer-- that is, the multiple choice which has the closest value to the correct answer.

7. Students are NOT allowed to communicate with anyone during the exam or exam collection period.

8. <u>You must sign the identification sheet before leaving.</u>

9. Stop writing immediately upon being told that the exam is over. Students who continue writing may be subject to a penalty.

Use the information below to answer <u>questions 1 to 4</u>

The objective of this question is to forecast the financial statements of Waterloo Manufacturing Corporation for 2020 (end of the year). Use the percent of sales method based on Year 2019 figures, and make the following assumptions:

1. Depreciation rate is equal to 7%.
2. The historical average growth CAPEX ratio is 50% of change in sales.
3. Dividends are zero in Year 2020.
4. Total Debt (Long-term debt) is the plug variable.

Use the financial statements of Waterloo Manufacturing Corporation to answer the questions that follow. Some of the forecasted values are already calculated for you.

	Real		Forecasted
Income Statement	**2018**	**2019**	**2020**
Revenues	292,367	349,536	307,592
Operating Expenses	139,923	195,593	
SG&A	37,091	39,369	
Depreciation	38,673	28,883	
Interest	30,327	13,262	
Income Before Tax	46,353	72,429	67,559
Income Tax	12,678	14,486	
Net Income	33,675	57,943	
Balance Sheet			
Total Current Assets	35,055	39,405	34,676
PP&E	313,285	319,162	319,162
Total Assets	348,340	358,567	353,838
Total Current Liabilities	58,864	72,256	63,585
Total Debt	179,565	125,157	
Total Liabilities	238,429	197,413	
Common Stock	202,000	202,000	202,000
Retained Earnings	(92,089)	(40,846)	
Total Equity	109,911	161,154	

1. What is the depreciation expense in Year 2020?

A) $22,555
B) *$24,023
C) $28,390
D) $32,239
E) $45,663

2. What is the interest expense in Year 2020?

A) *$9,244
B) $12,930
C) $15,290
D) $25,681
E) $28,025

3. What are the retained earnings for 2020?

A) $26,299
B) $25,038
C) $20,598
D) *$13,201
E) $6,456

4. What is total Debt (long term debt) in Year 2020?

A) $96,773
B) $87,193
C) $85,841
D) $77,642
E) *$75,052

Use the information below to answer <u>questions 5 to 8</u>

Bluesky Inc. is currently evaluating to buy a new factory to ramp up production. Thus, they need to estimate its cost of capital to properly evaluate this new project.

Debt	
Number of bonds outstanding =	50,000
Face value =	$1,000
Maturity =	3 years
Coupons =	$90
Yield to Maturity =	6%
Tax rate =	30%
Equity	
Book Value =	$25
Market Price =	$24
Shares Outstanding =	8M
Beta =	1.2
Risk Free Rate =	4%
Expected Return on Market =	8%
Latest dividend issued (yesterday)=	$1
First dividend per share paid (4 years ago)=	0.8

5. Based on the CAPM, what is the required return of Bluesky Inc. shareholders?

A) 7.2%
B) 8.4%
C) 9.2%
D) *8.8%
E) 10.1%

6. Based on the Constant Growth Model, what is the required return of Bluesky Inc. shareholders?

A) 9.25%
B) 11.23%
C) 8.56%
D) 8.93%
E) *10.14%

7. What is the price for Bluesky Inc. bonds?

A) $1,415
B) $845
C) $976
D) *$1,080
E) $1,115

8. Suppose that the cost of equity is 9% and the bond price is $1,015, what is the WACC for Bluesky Inc.?

A) 6.20%
B) *8.00%
C) 7.22%
D) 8.93%
E) 9.26%

Use the following information to answer questions 9 to 11

Cameron Industries is considering replacing a chemical vapor depositor for a more efficient model. The existing chemical vapor depositor was purchased 3 years ago for $4.85 million. It could be sold today for $1.25 million and its expected salvage value in 2 years is $0.55 million. The vapor depositor is in Class 43 with a 30% depreciation rate.

The new chemical vapor depositor costs $4.25 million. The new machine will be sold for $1.55 million at the end of 2 years. The new machine will increase revenues by $900,000 per year and operating expenses will stay the same. The Company's tax rate is 40% and its cost of capital is 12%. The new machine will not affect working capital. Assume that the replacement occurs immediately and that the operating cash flows occur at the end of each of the next two years.

9. What is the incremental initial cash flow for the replacement project?

A) -$3,600,000
B) -$4,850,000
C) -$1,250,000
D) *-$3,000,000
E) -$4,250,000

10. What is the (incremental) depreciation expense for the project in Year 2?

A) $484,000
B) $360,000
C) $527,600
D) $634,000
E) *$765,000

11. Assume that the Undepreciated Capital Cost at the end of Year 2 is $1.5 million. What is net incremental salvage value (incremental salvage value + PV of incremental tax shields) of the machine in Year 2?

A) $853,843
B) *$1,142,857
C) $1,287,442
D) $1,435,135
E) $1,658,728

12. Nesvita has $20 million to invest. Projects A, B and C are available. Which projects should it invest in?

Project	Initial cost	NPV	PI
A	$10 M	$2 M	1.20
B	$11 M	$4 M	1.36
C	$8 M	$1 M	1.13

A) A, B and C
B) *B and C
C) A and C
D) Only B
E) A and B

13. Airbus invested 900 million at the beginning of 2012 to buy and install the equipment to produce 35 airplanes every year from 2012 to 2017. The average cost of production for each aircraft was $14 million. Airbus sold each airplane for $16 million, therefore the cash flows are 70 million per year [(16M-14M)x35]. How many planes per year would Airbus have to sell to have a payback period of 6 years?

A) 45
B) 55
C) 65
D) *75
E) 85

14. Colormax is considering purchasing one of the two paint-mixing machines available in the market to reduce labor costs: model XX or model YY. Both machines cost $150. Model XX generates $180 of labor savings at the end of the first year and nothing at the end of 2 years. Model YY generates no labor savings at the end of the first year and $200 of savings at the end of 2 years. The NPVs of each model at different cost of capital are shown in the table below:

Cost of Capital	**Model XX**	**Model YY**
5%	$21.43	$31.41
11.11%	$12.00	$12.00
15%	$6.52	$1.23

Given the information above, if the weighted average cost of capital for Colormax is 10%**,** which project(s) will it choose?

A) Model XX
B) *Model YY
C) Any of them
D)None of them

Use the following information to answer questions 15 and 16

The Ren Co is submitting a bid to renovate the school building for Skaters School for the next 4 years. Ted Baker, the CEO, has two technology options to complete the work under the contract:

- Machine A has an installed cost of $50,000 but is expected to generate operating cash flows of $20,000 a year for 4 years. After 4 years, the machine has no salvage value. Ignore any tax impact of salvage.
- Machine B has only a 2-year lifetime and its installed cost is $30,000. For the 2 years it is expected to produce operating cash flows of $20,000 a year. It can be replaced after two years at the same initial cost. Machine B have no salvage value and ignore the tax impact of salvage.

The cost of capital for Ren Co is 12%.

15. Using the replacement chain approach to compute the NPV of each project, which project has the highest NPV and by how much?

A) Machine B has a higher NPV by $725.
B) Machine B has a higher NPV by $345.
C) Machine A has a higher NPV by $2,847.
D) *Machine A has a higher NPV by $3,916.
E) The two projects have equal NPV.

16. Which project has the highest equivalent annual NPV and by how much?

A) Project 2 has a higher equivalent annual NPV by $1,120.
B) Project 2 has a higher equivalent annual NPV by $1,241.
C) *Project 1 has a higher equivalent annual NPV by $1,289.
D) Project 1 has a higher equivalent annual NPV by $1,960.
E) The two projects have equal equivalent annual NPV.

Use the following information to answer questions 17-19

BubblyCo is currently evaluating a new carbonated orange juice product called Bubblo Soda that is superior to competing orange products. The company has finished a market study that shows promising sales for the new product. The cost of the marketing study was $5,000. Machinery with an estimated cost of $100,000 will be purchased to manufacture the soda. BubblyCo's inventories of row material would have to be increased by $30,000 at the time of the initial investment. The machinery has a CCA rate of 25% and it is expected to have a salvage value of $48,000 after 2 years of use and at the same time the inventories of row material will be liquidated.
BubblyCo's management expects to sell 200,000 bottles of the new product in each of the next 2 years at a price of $2.00 per bottle, but $1.50 per bottle would be needed to cover fixed and variable operating costs. BubblyCo's tax rate is 40%, and the overall cost of capital is 10%.

17. What is the initial cash flow of the project?

A) -$70,000
B) -$100,000
C) *-$130,000
D) -$110,000
E) -$75,000

18. What is the Operating Cash flow in year 1?

A) $72,500
B) $78,200
C) $64,230
D) *$65,000
E) $52,500

19. What is the present value (at the end of the second year) of the remaining CCA tax shields in the years following the end of the project?.

A) *$5,036
B) $4,877
C) $6,275
D) $6,525
E) $4,390

20. Interest expenses are excluded as cash flows in NPV calculations because:

A) Financing costs are sunk costs, and hence are not included.
B) There are multiple ways to obtain financing and it is too difficult to estimate financing costs over the life of the project.
C) * The WACC, implicitly includes financing costs; consequently it is not correct to include financing costs as cash flows.
D) Financing costs are not included in cash flow statements (i.e. they are non-cash charges) and therefore do not belong in NPV calculations.
E) Financing costs are included in projects, but only if the firm issues new equity.

Use the following information to answer questions 21 and 22

Project M&M has an initial investment $200,000, at t = 0. Project M&M's cash flows (CFs) depend on the customer acceptance of the product. There is a 60% probability that the product will be wildly successful and generates CFs of $125,000 every year during three years. There is a 40% chance that the CFs generated over the same period are only $25,000. Assume that the WACC is 12%. Therefore the project will generate an expected NPV = $ 4,155.66. Assume that the company has the option to abandon the project after one year, if the first year cash flow is $25,000. The option to abandon also allows to the company to recoup $35,000 of the initial investment at the end of the first year.

21. What is the expected NPV with the option to abandon the project ?

A) *$1,565.85
B) $60,137.28
C) $100,228.80
D) $3,500
E) $15,851.63

22. What is the value of the option?

A) *0
B) $-1,155.66
C) $55,981.62
D) $-2,598.81
E) $-655.66

Use the following information to answer questions 23 to 24

The objective of this question is to estimate the value of the company Qinetiq Inc. Financial information for the company up to December 2019 has been used to forecast financial statements until December 2020 as show in the table below. Assume that the cost of capital is 7%; the estimated terminal value growth rate is 2.5%, and there is not short term debt. Using the Discounted Cash Flow (DCF) valuation method, provide the answers to the following questions:

	Real	Forecasted
Income Statement	**2019**	**2020**
Revenues	287,456	305,254
Operating Expenses	164,379	186,439
SG&A	29,876	29,475
Depreciation	23,464	34,846
EBIT	69,737	54,494
Interest	46,540	12,639
Income Before Tax	23,197	41,855
Income Tax	6,542	14,486
Net Income	16,655	27,369
Balance Sheet		
Cash	5,688	7,456
Account Receivables	20,617	21,893
Inventory	8,750	10,088
Total Current Assets	35,055	39,437
PP&E	265,433	277,165
Total Assets	300,488	316,602
Account Payables	14,598	15,362
Other current liabilities	14,387	17,947
Total Current Liabilities	28,985	30,865
Total Debt	131,592	118,457
Total Liabilities	160,577	149,322
Common Stock	135,000	135,000
Retained Earnings	4,911	32,280
Total Equity	139,911	167,280

23. If the Free Cash Flow for 2020 is equal to $23,168, what is the present value of the estimated terminal period cash flows at the end of 2019?

A) $14,237,000
B) $1,319,000
C) $527,716
D) *$493,192

24. Let's assume that the value of the firm at the end of 2019 is 1,400,000 there are 40,000 shares outstanding, what is the estimated stock price for Qinetiq Inc. ?

A) *$31.71 dollars
B) $38.32 dollars
C) $44,77 dollars
D) $29,32 dollars

25. What is the difference between taxes in operating cash flows and taxes on the income statement?

A) Income taxes in operating cash flows are lower by an amount equal to (T × $Interest expense).
B) Income taxes in operating cash flows are lower by an amount equal to (T × $Interest expense)+(T × $Depreciation).
C) *Income taxes in operating cash flows are higher by an amount equal to (T × $Interest expense).
D) Income taxes in operating cash flows are higher by an amount equal to (T × $Interest expense)+(T × $Depreciation).
E) There is no difference.

BU393
WINTER 2020
Formula Sheet Midterm Exam

$\text{PVIF}_{n,i} = \frac{1}{(1+i)^n} = (1+i)^{-n}$	$\text{FVIF}_{n,i} = (1+i)^n$
$\text{PVIFA}_{n,i} = \frac{1}{i}[1-(1+i)^{-n}]$	$\text{FVIFA}_{n,i} = \frac{1}{i}[(1+i)^n - 1]$
$P_{\text{zero}} = \frac{\$\text{FV}_n}{(1+i_n)^n}$	$P_{\text{coup}} = \$\text{C} \cdot \frac{1}{k_d}[1-(1+k_d)^{-n}] + \frac{\$\text{FV}}{(1+k_d)^n}$
$P_0 = \frac{D_0(1+g)}{\text{k-g}} = \frac{D_1}{\text{k-g}}$	$\text{EAA} = \text{NPV}/\text{PVIFA}_{k,n}$

Capital Budgeting

$\boldsymbol{Payback} = \frac{Initial\ Investment}{Annual\ cash\ flow}$	$NPV = \sum_{t=0}^{n} \frac{CF_t}{(1+k)^t}$
$0 = \sum_{t=0}^{n} \frac{CF_t}{(1+IRR)^t}$	$PI = \frac{\sum_{t=1}^{n} \frac{CF_t}{(1+k)^t}}{CF_0}$
Terminal Value = OCF + Net Salvage + Decrease in NWC	Net Salvage = Salvage + PV Tax Shields
$\text{PV Tax Shields}_n = \frac{\text{T} \times \text{d} \times (\text{UCC}_n - \text{S})}{\text{k} + \text{d}}$	WACC = $w_E * k_E + w_D * k_D * (1\text{-T}) + w_P * k_P$ w_E = E/V w_D = D/V w_P = P/V

Free Cash Flow and Valuation

$\text{Net}_t = \text{Net}_{t-1} - \text{Depreciation}_t + \text{CAPEX}_t$	$\text{Depreciation}_t = \text{d x } [\text{Net}_{t-1} + \text{CAPEX}_t]$
$d = \frac{Depreciation_t}{Net_t + Depreciation_t}$ $\text{gx} = \frac{\text{gCAPEX}_t}{\Delta Sales_t}$	$\text{mCAPEX}_t = \frac{\text{d}}{1-\text{d}} \text{Net}_{t-1}$ CAPEX= mCAPEX + gCAPEX
FCF = OCF – ΔNWC - CAPEX	OCF = NI + Depr + $Int * (1-T)

OCF = EBIT*(1-T) + $Depr	OCF = R-COGS-SG&A-Taxes Where Taxes= EBIT x T
ΔNWC = NW C_t – NWC_{t-1}	NWC = (Current assets – Cash) – (Current Liabilities – Short-term Debt)
$PV_{FP} = \sum_{t=1}^{n} \frac{FCF_t}{(1+k)^t}$	$PV_{TP} = \frac{1}{(1+k)^n} \times \frac{FCF_n(1+g)}{k-g}$
V=PV_{FP} + PV_{TP} + Redundant Assets	