Print Last Name: ➔	Print First Name: ➔	ID Number: ➔	
COURSE FINANCE	**NUMBER** COMM 308	**SECTIONS: (➔ Circle your section)** A, AA, B, BB, C, CC, F	
EXAMINATION Final Exam **VERSION BLUE**	**DATE** December 9, 2019	**TIME** 3 hours 9:00 to 12:00	**# OF PAGES 17** including cover
INSTRUCTOR: **(➔ Underline your instructor's name)** Ahmed Eissa Roberto Gonzalez Trevino Ian Rakita June Riley Jaswinder Singh Edward Wong		**DIVISION** John Molson School of Business Concordia University	

READ THESE SPECIAL INSTRUCTIONS CAREFULLY

- You must submit a BLUE computer answer sheet.

- You are allowed to bring/use one or more calculators

- You are allowed to bring one language dictionary (no finance/ mathematics/economics etc. dictionary)

- For Multiple Choice Questions: All answers must be recorded IN PENCIL on the computer sheet.

- For Problems:
All answers must be recorded IN INK within this exam.
Show your calculations to earn part marks. Write in the space provided.
If you are using the back of the exam for answering any question, you should label it clearly

- Please ensure you have 17 pages (including the cover page) in this exam.

- Fill in your name and other required information IN PENCIL on the Computer Answer sheet as well as IN INK on this cover sheet.

- Blank questions or those with multiple answers will not receive any credit.

SCORES (FOR INTERNAL USE ONLY)

Part I Multiple Choice Questions	Part II Long Answer Questions			Total
	Question 1	Question 2	Question 3	
(Max: 75 Points)	(Max: 8 Points)	(Max: 11 Points)	(Max: 6 Points)	

Part I: Multiple Choice Questions (30 Questions, 75 Points Total):
Only MCQ answers IN PENCIL on the computer answer sheet (scantron) will be graded.

1. Which of the following best describes the reason for choosing the NPV rule over the IRR rule when dealing with mutually exclusive projects? NPV rankings:

   A) Assume reinvestment at the opportunity cost of capital.
   B) Are not affected by external interest rates or discount rates.
   C) Assume that cash flows are reinvested at the internal rate of return.
   D) Are superior because IRR rankings are unreliable
   E) Are more desirable.

2. The cash flows of projects A and B are given below:

Year	Cash flows	
	Project A	Project B
0	-1,500	-1,500
1	400	500
2	300	500
3	600	500
4	800	500

	DCF			
A			B	
	-1500	-1500	-1500	-1500
	357.1429	-1142.86	446.4286	-1053.57
	239.1582	-903.699	398.5969	-654.974
	427.0681	-476.631	355.8901	-299.084
	508.4145	31.78363	317.759	18.67467
		-0.93748		-0.94123

   For a 12% discount rate, as compared to project B, the discounted payback period of project A is approximately:

   A) equivalent.
   B) 0.93 years higher.
   C) 1.25 years higher.
   D) 1 year shorter
   E) Insufficient information

3. Jamie is a self-employed consultant. A prospective client has offered her three payment options. Jamie is currently earning 8.5% on her funds. Which one of the following statements is correct concerning Jamie's payment options?

   Option 1: $10,000 today plus $25,000 at the end of year 2
   Option 2: $5,000 today plus $9,000 at the end of year 1 and $22,000 at the end of year 2
   Option 3: $36,000 at the end of year 2

   A) At a 2% rate of return Option 3 is the best choice.
   B) At a 6% rate of return Option 1 is the worst choice.
   C) At an 8.5% rate of return Option 2 is the best choice.
   D) At a 0% rate of return all options are equivalent.
   E) At a 6% rate of return, Option 1 is the best choice.

4. A firm will start paying dividends four years from now and thereafter that will be expected to grow 5% into perpetuity. Expected dividend in year 4 is $5. If an investor's required rate of return is 7%, the intrinsic value (price) of the stock is closest to:

   A) $200
   B) $204
   C) $227
   D) $250
   E) Insufficient information

5. The £40 par value bond with maturity in two years and £5 semi-annual coupon is trading for £50. If the Yield to maturity is 7%, the bond is:

   A) Over-valued
   B) Fairly-valued
   C) Under-valued
   D) Over-valued or undervalued applies only to stocks priced through CAPM.
   E) Insufficient Information

6. An investor purchases a 2-year zero-coupon bond with par value of $1,000 at $960. The implied interest earned on the bond is closest to:

   A) $0
   B) $20
   C) $40
   D) None of the above. Interest should always be denoted in % not dollars,
   E) Unable to calculate because the discount rate is missing

7. Canfly Airlines is considering two mutually exclusive projects, Project A and Project B. The projects have the following cash flows (in millions of dollars):

Year	Project A Cash Flow	Project B Cash Flow
0	-$4.0	-$4.5
1	2.0	1.7
2	3.0	3.2
3	5.0	?

   The crossover rate of the two projects' NPV profiles is 9 percent. What is the cash flow for Project B at t = 3?

   A) $4.22 million
   B) $5.79 million
   C) $8.73 million
   D) 10.41 million
   E) Insufficient information

8. Which of the following statements is not true about the weighted average cost of capital (WACC) method?

   A) WACC cannot be used to evaluate projects in which the capital structure is significantly different from the firm's overall structure.

   B) WACC adjusts for the tax deductibility of interest costs.

   C) If WACC is greater than the IRR of a project and the cash flows are conventional, then, the NPV of the project will always be less than zero.

   D) Average company WACC should not be used for evaluating projects in a multi-segment conglomerate.

   E) If WACC is less than IRR of a project, then, the NPV of the project will always be greater than zero.

9. PowerRus Company is considering a project that calls for an initial cash outlay of $50,000. The expected net cash inflows from the project are $6,000 every two years in perpetuity. What is the IRR of the project?

   A) 5.83%

   B) 6.00%

   C) 8.33%

   D) 12%

   E) None of the above

10. The long-term debt of Loonie Bank is currently selling for 103 percent of its face value. The issue matures in 20 years and pays an annual coupon of 8 percent of face. The corporate tax rate is 40 percent. What is the after-tax cost of debt for Loonie Bank?

    A) 3.08%

    B) 4.62%

    C) 4.80%

    D) 7.70%

    E) None of the above

11. Consider the following information on profit expectations and the probabilities of their occurrence.

Profits ($*000*)	250	250	350	400	600	650
Probabilities	0.10	0.15	0.25	0.25	0.15	0.10

    The expected value of profits is:

    A) 375.00.

    B) 380.76.

    C) 395.00.

    D) 405.00.

    E) 416.67.

12. The SloMo Co. has a return on equity of 8% and pays out 25% of earnings in dividends. The expected growth in dividends is:

A) 2%
B) 6%
C) 8%
D) 75%
E) Insufficient Information

13. The Shrammer Company has a beta of 1.30, the risk free rate is 4% and the return on the market is 10%. The required return on the firm's equity is:

A) 5.2%
B) 6.0%
C) 10.0%
D) 11.8%
E) 17%

14. The term that is used to refer to situations in which the probabilities of multiple outcomes are known or may be estimated is:

A) Risk.
B) Danger.
C) Complete Ignorance
D) Uncertainty.
E) Ambiguity.

15. You have found your dream home in Chicoutimi, Quebec. The selling price is $120,000; you will put $20,000 down and obtain a 25-year fixed-rate mortgage at 8.25% for the rest. Although you will get a 25-year mortgage, you plan to prepay the loan by making an additional payment each month along with your regular payment. How much extra must you pay each month if you wish to pay off the loan in 20 years? Canadian Mortgages are quoted as APR compounded semiannually.

A) $24.56
B) $54.88
C) $64.17
D) $93.28
E) None of the above.

16. For rating agencies, the primary factor in assigning their ratings is:

A) likelihood of market crash.
B) potential loss severity.
C) priority of payment in the event of a default.
D) probability of fraud.
E) likelihood of default.

17. Assuming the correlation between an asset and market is 0.67 and the asset and market have standard deviations of 0.34 and 0.19 respectively, the asset's beta would be closest to:

A) 0.09
B) 1.00
C) 1.20
D) 1.97
E) 3.53

18. The capital market line:

A) Summarizes alternative combinations of risky and risk-free investment of which an investor will be indifferent.
B) Summarizes the relationship between the price volatility of a given stock with the price volatility of "average" stock prices.
C) Summarizes the market opportunities available to an investor from a portfolio consisting of risky and risk-free investments.
D) Is used to compare risk involving two or more outcomes involving different expected values.
E) A pictorial representation of the CAPM

19. Automobile insurance companies attempt to reduce the problem of moral hazard by:

A) Refusing to insure bad drivers.
B) Offering liability insurance to drivers with bad driving records, but refusing to offer collision insurance.
C) Requiring a deductible on insurance claims.
D) Offering no-fault insurance.
E) By segmenting the market into low risk and high risk groups.

20. Consider the following information on profit expectations and the probabilities of their occurrence.

Profits (*$000*)	250	250	350	400	600	650
Probabilities	0.10	0.15	0.25	0.25	0.15	0.10

The standard deviation of profit expectations is:

A) 135.92.
B) 143.37.
C) 147.73.
D) 151.39.
E) None of the above.

21. You are considering acquiring a common stock that you would like to hold for one year. You expect to receive both $1.25 in dividends and $32 from the sale of the stock at the end of the year. The maximum price you would pay for the stock today is _____ if you wanted to earn a 10% return.

A) $30.23
B) $24.11
C) $26.52
D) $27.50
E) none of the above

22. The intercept of the security market line (SML) is:

A) Beta
B) Market risk premium
C) Jensen's alpha
D) Risk free rate
E) Total risk

23. Project A has an expected value of $150,000 and a standard deviation of $45,000. Project B has an expected value $75,000 and a standard deviation of $22,500.

A) Project A is the relatively riskier project.
B) Project B is the relatively riskier project.
C) Project A and Project B are equally risky.
D) It is not possible to determine which project is relatively riskier without first knowing the projects cash flow and discount rate.
E) It is not possible to answer this question without first knowing if the investor is risk averse or risk loving.

24. The value of a call increases when:

I. the time to expiration increases.
II. the stock price increases.
III. the risk-free rate of return increases.
IV. the volatility of the price of the underlying stock increases.

A) I and III only
B) II, III, and IV only
C) I, III, and IV only
D) I, II, and III only
E) I, II, III, and IV

25. William and Theodore have decided to start a travel business called Excellent Adventures. Since their business primarily involves time-travel their clients may be harmed during a small but significant portion of the travels. Consequently, William and Theodore would like a business form that will shield their personal wealth from any legal claims that the firm might be subject to after one of the travel mishaps. If William and Theodore are the only investors in this U.S. domiciled firm, which legal form of organization would be best for Excellent Adventures to protect both William and Theodore?

A) sole proprietorship
B) partnership
C) limited partnership
D) corporation
E) Either Partnership or Corporation

26. If security markets are perfectly informationally efficient, then:

a. The net present value of all securities should be zero.
b. The profitability Index of all security investments should be one.
c. The discounted payback period of all projects should be a measure of the issuing companies expected life.

A) Only (a) is true
B) Both (a) and (b) are true
C) Both (a) and (c) are true
D) All (a), (b), and (c) are true
E) None of the above are true. These are capital budgeting concepts and have nothing to do with efficient market hypothesis.

27. Three friends Sam, Patricia and Robert will receive equal dollar amounts in two years from their maturing investments, however, they invested in such a way that:

- The interest rate offered to Patricia and Sam is the same but compounding for Patricia is monthly and for Sam it is quarterly.
- Compounding for Robert and Patricia is the same but the interest rate offered to Robert is higher.

The present value of whose investment would be the lowest?

A) Sam
B) Robert
C) Patricia
D) They will hall have the same present value
E) Insufficient information

28. An account was opened with $1,000 ten years ago. Today, the account balance is $1,500. If the account paid interest compounded annually, how much interest on interest was earned?

A) $86.20
B) $93.10
C) $102.39
D) $130.28
E) None of the above

29. Torque Corporation is expected to pay a dividend of $1.00 in the upcoming year. Dividends are expected to grow at the rate of 6% per year. The risk-free rate of return is 5% and the expected return on the market portfolio is 13%. The stock of Torque Corporation has a beta of 1.2. What is the intrinsic value (Price) of Torque's stock?

A) $14.29
B) $14.60
C) $12.33
D) $11.62
E) none of the above

30. A credit card company charges you an effective interest rate of 1.25% monthly. The annual percentage rate (compounded monthly) is ____ and the effective annual rate is _____

A) 15.00%; 15.00%
B) 15.00%; 14.55%
C) 14.55%; 15.00%
D) 15.00%; 16.08%
E) 16.08%; 15.00%

Part II: Problems (25 Points Total)

- Answer on this document, in the space provided. Use the back of the sheet if you need additional space. Label it clearly. Any work on the back of the sheet, which is not labeled clearly, will not be graded.

Q1. (8 Points) Application of Time Value Mechanics:

Large jackpots in most U.S. lotteries are paid out in equal annual installments. The winner can also request immediate payment, but in this case the jackpot is reduced and only the so called "cash value" is paid out.[1] In Connecticut for example, large jackpots are paid out in 21 equal installments (with the first installment payable immediately when the winner is confirmed) and the cash value is 57% of the total jackpot. So if you happened to win $1,000,000 on the Connecticut Lotto, you would receive $1,000,000/21 = $47,619.05 right now, another $47,619.05 one year from now etc. until all 21 installments have been paid. Alternatively, you could tell the Lotto administrator that you want to receive the cash value of $1,000,000 × 0.57 = $570,000 right now. Below you will find the number of annual installments and the cash value for two popular U.S. lotteries:

Lottery	Number Of Annual Installments	Cash Value
Connecticut	21	57%
Michigan	30	50%

Suppose that the annual interest rate (EAR) is 8%. Would you choose the installments or the cash value if you won a million dollar on the Connecticut Lotto? How about the Michigan - Classic Lotto 47? What is the difference (in terms of present value) between the Annual installments and the cash values of the two lotteries?

Lottery	Number Of Annual Installments	Cash Value	Installments	Cash Value	r = 8% PV(inst.)
Connecticut	21	57%	$ 47,619.05	$ 570,000.00	$515,149.88
Michigan	30	50%	$ 33,333.33	$ 500,000.00	$405,280.20

Suppose instead that the annual interest rate (EAR) is 8%. Would you choose the installments or the cash value if you won a large sum on the Colorado Lotto? How about the Connecticut - Classic lotto? The Michigan - Classic Lotto 47?
Assume that the winning amount is $1,000,000
Connecticut --> Cash Value of $570,000 ← 1 Point for this decision
Michigan --> Cash Value of $500,000 ← 1 Point for this decision

2 X (0.5 for correct cash value, 0.5 for correct Installment) ← Total 2 Point
2 X (2 Points for getting the PV of installments) ← 4 Point

Note: "2 X" refers to the two lotteries.

[1] For the sake of simplicity, we will ignore the fact that lottery winnings are considered taxable income in the United States.

…. Sheet left blank for question 1 calculations…

Q2. (11 Points) Capital budgeting decision:

You are looking to invest in a new machine for your production plant. The machine costs $8000. You expect to make products on this machine for 4 years, and then you will no longer need the machine. Revenues of the company are expected to increase by $1000 each year the machine is in production. The machine is also expected to decrease production costs of the company by $3000 per year. There is no net change in working capital due to the new machine. The market value of the machine in 4 years is expected to be $1000. The company will depreciate the machine using straight-line depreciation, expensing $2000 per year as a depreciation expense. The corporate tax rate is 34%, and the required rate of return demanded by the company on any capital expenditure is 10%. Should the company buy the machine?

Use the template below to estimate the incremental cash flow)

Year	0	1	2	3	4
Sales					
Costs					
Operating income (Sales - costs)					
After tax operating income					
NWC					
Change(NWC)					
Capital asset					
Depreciation					
Tax Shields					
CF					

NPV = _ _____

Decision: should the company buy the machine? (Yes/No?)_____

… Sheet left blank for Question 2 calculations….

Since we do not teach Capital gains tax in Comm 308, We will accept both versions of the solution (as indicated below)

Version 1: recognizes the $1000 as taxable capital gain

Year	0	1	2	3	4	
Sales		$ 1,000.00	$ 1,000.00	$ 1,000.00	$ 1,000.00	← 0.5 Point
Costs		-$ 3,000.00	-$ 3,000.00	-$ 3,000.00	-$ 3,000.00	← 0.5 Point
Operating income (Sales - costs)		$ 4,000.00	$ 4,000.00	$ 4,000.00	$ 4,000.00	← 1 Point
After tax operating income		$ 2,640.00	$ 2,640.00	$ 2,640.00	$ 2,640.00	← 1 Point
NWC						
Change(NWC)						
Capital asset	-$ 8,000.00				$ 1,000.00	← 0.5 Point
Depreciation		$ 2,000.00	$ 2,000.00	$ 2,000.00	$ 2,000.00	← 0.5 Point
Tax Shields		$ 680.00	$ 680.00	$ 680.00	$ 680.00	← 2 Point
CF	-$ 8,000.00	$ 3,320.00	$ 3,320.00	$ 3,320.00	$ 3,980.00	← 2 Point

NPV	$ 2,974.74	← 2 Point
Decision -->	**Accept the project because the NPV > 0**	← 1 Point

Version 2: Ignore Capital gains tax

Year	0	1	2	3	4	
Sales		$ 1,000.00	$ 1,000.00	$ 1,000.00	$ 1,000.00	← 0.5 Point
Costs		-$ 3,000.00	-$ 3,000.00	-$ 3,000.00	-$ 3,000.00	← 0.5 Point
Operating income (Sales - costs)		$ 4,000.00	$ 4,000.00	$ 4,000.00	$ 4,000.00	← 1 Point
After tax operating income		$ 2,640.00	$ 2,640.00	$ 2,640.00	$ 2,640.00	← 1 Point
NWC						
Change(NWC)						
Capital asset	-$ 8,000.00				$ 1,000.00	← 0.5 Point
Depreciation		$ 2,000.00	$ 2,000.00	$ 2,000.00	$ 2,000.00	← 0.5 Point
Tax Shields		$ 680.00	$ 680.00	$ 680.00	$ 680.00	← 2 Point
CF	-$ 8,000.00	$ 3,320.00	$ 3,320.00	$ 3,320.00	$ 4,320.00	← 2 Point

NPV	$ 3,206.97	← 2 Point
Decision -->	**Accept the project because the NPV > 0**	← 1 Point

Q3. (6 Points)

Note: when drawing payoff or profit diagrams, you need to show the location of each important point on the diagram by writing down the relevant numbers next to each point (i.e. indicate intersections with the horizontal and vertical axes and any points where the payoff/profit function changes abruptly).

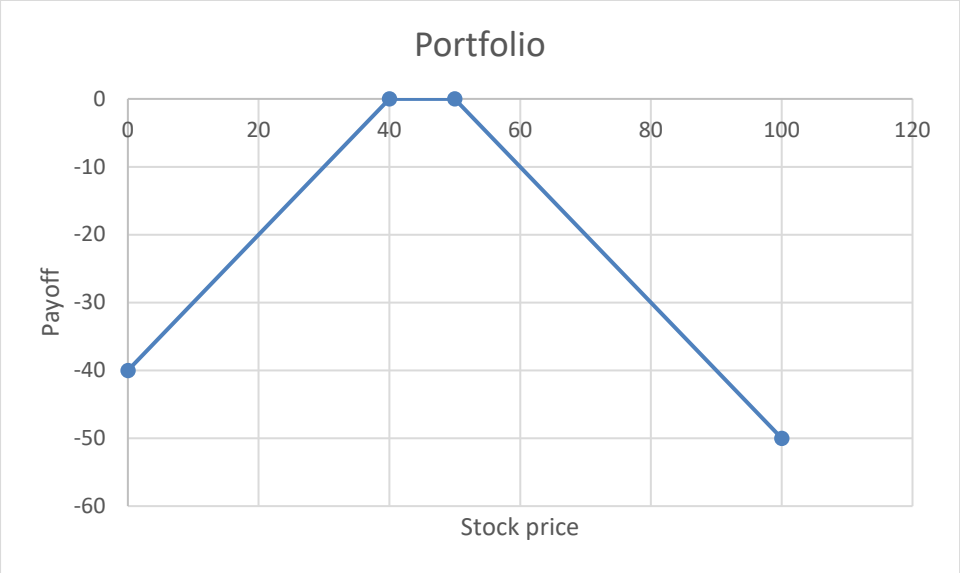
An investor constructs the following portfolio:

- Short a European Put option with a strike price of $40.00.
- Short a European Call option with a strike price of $50.00

This trading strategy is known as a Short Strangle.

Draw the payoff diagram for the above Short Strangle.

Stock price	0	40	50	100
Short P(40)	-40	0	0	0
Short C(50)	0	0	0	-50
Portfolio	-40	0	0	-50



Correctly labeling x-axis (Stock price) ← 1 Point
Correctly labeling y-axis (Payoff) ← 1 Point
Correctly identifying (0,-40) ← 1 Point
Correctly identifying (40, 0) ← 1 Point
Correctly identifying (50, 0) ← 1 Point

Getting the complete picture correct ← 1 Point

Equation	Formula
Present Value	$\mathrm{PV}_0 = \frac{\mathrm{FV}_\mathrm{n}}{(1+\mathrm{k})^n} = \mathrm{FV}_\mathrm{n} \times \frac{1}{(1+k)^n}$
Future Value (Ordinary Annuity)	$FV_\mathrm{n} = \mathrm{PMT}\left[\frac{(1+\mathrm{k})^n - 1}{k}\right]$
Present Value (Ordinary Annuity)	$\mathrm{PV}_0 = \frac{\mathrm{PMT}}{k}\left[1 - \frac{1}{(1+k)^\mathrm{n}}\right]$
Future Value (Annuity Due)	$\mathrm{FV}_\mathrm{n} = \mathrm{PMT}\left[\frac{(1+k)^\mathrm{n} - 1}{k}\right](1+k)$
Present Value (Annuity Due)	$\mathrm{PV}_0 = \frac{\mathrm{PMT}}{k}\left[1 - \frac{1}{(1+k)^\mathrm{n}}\right](1+k)$
Present Value (Perpetuity)	$\mathrm{PV}_0 = \frac{\mathrm{PMT}}{k}$
Growing Perpetuity	$\mathrm{PV}_0 = \frac{\mathrm{PMT}_0(1+g)}{k-g} = \frac{\mathrm{PMT}_1}{k-g}$
Growing annuity	$\mathrm{PV}_0 = \frac{\mathrm{PMT}_1}{k-g} \times \left[1 - \left(\frac{1+g}{1+k}\right)^n\right]$
Effective Annual Rate	$k = \left(1 + \frac{QR}{m}\right)^m - 1$
Effective Period Rate (for any period *f*)	$k = \left(1 + \frac{QR}{m}\right)^{\frac{m}{f}} - 1$
Bond Valuation	$\mathrm{PV}_0 = \frac{\mathrm{I}}{k_b}\left[1 - \frac{1}{(1+k_b)^\mathrm{n}}\right] + \frac{F}{(1+k_b)^\mathrm{n}}$
Fisher Relationship	RF = [(1 + Real rate)(1 + Expected inflation)] – 1
Market Price of Preferred Shares	$P_{ps} = \frac{D_p}{k_p}$

Constant Growth Dividend Discount Model	$P_0 = \frac{D_0(1+g)}{k_c - g} = \frac{D_1}{k_c - g}$
Sustainable Growth Rate	g =b × ROE
P/E Ratio Approach	P_0 = Estimated EPS_1 × Justified P/E ratio = $EPS_1 \times P_0/E_1$
P/E Ratio (Using Constant Growth DDM)	$\frac{P_0}{EPS_1} = \frac{P}{E} = \frac{D_1 / EPS_1}{k_c - g}$
Total Return	Total return = Income yield + Capital gain (or loss) yield $= \frac{CF_1 + P_1 - P_0}{P_0}$
Expected Return (Individual)	$ER = \sum_{i=1}^{n}(r_1 \times Prob_i)$
Standard Deviation for Individual Returns Ex-Post	Ex post $\sigma = \sqrt{\frac{\sum_{i=1}^{n}(r_i - \bar{r})^2}{n-1}}$
Standard Deviation for Individual Returns Ex Ante	Ex ante $\sigma = \sqrt{\sum_{i=1}^{n}(\text{Prob}_i)(r_i - ER)^2}$
Expected Portfolio Return	$ER_p = \sum_{i=1}^{n}(w_i * ER_i)$
Standard Deviation of a Two-Security Portfolio (Using Covariance)	$\sigma_p = \sqrt{(w_A)^2(\sigma_A)^2 + (w_B)^2(\sigma_B)^2 + 2(w_A)(w_B)(COV_{AB})}$
Covariance of Returns	$COV_{AB} = \sum_{i=1}^{n}\text{Prob}_i(r_{A,i} - \bar{r}_A)(r_{B,i} - \bar{r}_B)$
Covariance of Returns (Using Correlation Coefficient)	$COV_{AB} = \rho_{AB}\,\sigma_A\,\sigma_B$
Sharpe Ratio	Sharpe ratio $= \frac{ER_p - RF}{\sigma_p}$
Beta	$\beta_i = \frac{COV_{i,M}}{\sigma_M^2} = \frac{\rho_{i,M}\sigma_i}{\sigma_M}$
Portfolio Beta	$\beta_p = w_1\beta_1 + w_2\beta_2 + ... + w_n\beta_n$
CAPM	$k_i = RF + (ER_M - RF)\beta_i$

Alpha	$\alpha_i = (R_i - RF) - [\beta_i(R_M - RF)]$
Net Present Value	$\text{NPV} = \sum_{t=1}^{n} \frac{CF_t}{(1+k)^t} - CF_0$
Profitability Index	$\text{PI} = \frac{\text{PV(cash inflows)}}{\text{PV(cash outflows)}}$
Initial Cash Outlay	$CF_0 = C_0 + \Delta NWC_0 + OC$
Annual After-Tax Cash Flows	$CF_t = CFBT_t\,(1 - T) + CCA_t\,(T)$
Ending Cash Flow (ignoring tax implications)	$ECF_n = SV_n + \Delta NWC_n$
Net Present Value	$NPV = PV(\text{Annual CFs}) + PV(ECF_n) - CF_0$
WACC with Preferred Shares	$WACC = K_e \frac{S}{V} + K_p \frac{P}{V} + K_i \frac{D}{V}$