

Name: _____

Id. No: _____

Birla Institute of Technology and Science, Pilani
First Semester: 2023-2024

Comprehensive Exam (Regular)

Course Name & No.: **Financial Management (ECON / FIN F 315)**

Maximum Marks: (120 Marks) 40% Weight-age

Duration: 180 Minutes

Date: 13 Dec 23

Type: Open Book

Instructions for the students (PART A)

1. Write your name and BITS Id No in the space provided on the top of this page
2. This **Part A** of the paper consists of 25 MCQs of 2 marks each and 5 short-answer type questions. Total 78 marks. For short-answer type questions write your answers in the space provided.
3. There is **no negative marking** in the question paper.
4. For MCQs, write your answers in the table provided below. Answers written elsewhere or in incorrect order will not be evaluated. **Overwritten/ambiguous answers will not be evaluated.**

Table for MCQs

1	2	3	4	5	6	7	8	9	10	11
12	13	14	15	16	17	18	19	20	21	22

Time: It is suggested that this part is completed within 120 minutes so that you can proceed to Part B. All returns given in % are on a per annum basis unless explicitly mentioned otherwise.

1. As per principles of corporate finance, the shareholder's wealth in a firm is reflected by:
a. The annual profits of the company b. Its earnings per share c. Its price-to-earnings ratio
d. The firm's current total book value as per the balance sheet e. None
2. The interest rate on Treasury bill is 6%. A risky asset is expected to return either 12% with 40% probability or 2% with a 60% probability. It is likely that: (2)
a. A risk averse investor would not invest in the risky asset it does not reward a risk premium
b. A risk averse investor would not invest in the risky asset because it has a negative risk premium
c. A risk averse investor might invest in Asset A because investment choices are a matter of personal preferences
d. A risk averse investor might invest in Asset A because it rewards the investor with a positive risk premium
e. A risk averse investor will be indifferent to risky and risk free asset
3. The firm's annual sales are Rs 150 million and its operating profit margin is 25%. If interest and tax expenses are 10% of operating profit, the firm's net profit margin will be: (2)
a. 15% b. 20% c. 33.75% d. 22.5% e. None
4. If the price-to-earnings (PE) ratio of a firm increases (ceteris paribus) it is most likely that:
a. The dividend pay-out ratio decreases b. The EPS increases c. The dividend yield decreases
d. The retention ratio increases e. The net income increases
5. Two investors with different holding periods but the same expectations and required rate of return for a company are estimating the intrinsic value of a common share. The investor with the shorter holding period will most likely estimate a:
a. lower intrinsic value b. higher intrinsic value c. similar intrinsic value d. none
6. A project has an expected risky cash flow of \$500 in year 3. The risk-free rate is 4%, the expected market rate of return is 14%, and the project's beta is 1.20. Given the risk-return characteristics, what is the equivalent minimum guaranteed cash flow in year 3 for this project (in \$)?
a. 562.43 b. 444.50 c. 360.33 d. 320.5 e. None of the above

7. ABC Ltd just paid a dividend of \$1.40. Analysts expect its dividend to grow at a rate of 10% next year, 8% for the following two years, and then a constant rate of 5% thereafter. What is the expected dividend per share at the end of year 5?

- a. \$2.08 b. \$1.98 c. \$1.80 d. \$0.99 e. None of the above

8. A company forecasts growth of free cash flows to be 6% for the next five years and 3% thereafter. Given that last year's free cash flow was \$100, what is the expected (intrinsic) value of the company at the end of 5 years if it discounts its expected free cash flows with a cost of capital of 8%?

- a. Cannot determine b. \$0 c. \$1672 d. \$2676 e. None of the above

9. Accountants do not depreciate investment in net operating working capital because:

- a. it is not a cash flow. b. it is a sunk cost. c. it appears on the balance sheet, not the income statement. d. It changes every year based on futures sales e. None of the above

10. Mr. Kishore has been nominated to serve on the board of directors of ABC Ltd, an entertainment conglomerate. His experience *most likely* qualifies him to serve the best interests of CoMedia's shareowners if he:

- a. served on the board of a pharmaceutical company for the past eight years.
b. has a long-standing professional relationship with several CoMedia executives.
c. adheres to a policy of not owing shares of companies for which he serves as a director.
d. is currently serving as director in a media company, which is a close competitor of ABC Ltd.
e. none

11. ABC Ltd. plans to borrow \$12 million, which it will use to repurchase shares. Shares outstanding at the time of buyback 2.2 million, planned share repurchase 200,000 shares, profit after tax \$6.6 million, cost of borrowed funds 7.69%, corporate tax rate 35%, current share price \$60. The EPS after share repurchase will be:

- a. \$1.7 b. \$2.8 c. \$3.0 d. \$2.0 e. none of the above

12. Inverness Corporation is considering investing in one of two mutually exclusive capital projects. The firm's cost of capital is 15%. Project A's NPV profile crosses the Y-axis at \$1.8 million and crosses the X-axis at 25%. Project B's NPV profile crosses the Y-axis at \$1.2 million and crosses the X-axis at 33%. For the two projects, the crossover rate is 18%. Which of the following is *most likely* correct?

- a. If Project B is selected, it is considered the company's lower-than-average-risk project.
b. If Project A is selected, it is considered the company's lower-than-average-risk project.
c. None of the projects will be selected since the firm's cost of capital is less than the cross-over rate.
d. Both projects can be selected as long as their cost of capital is less than the promised IRR.
e. None

13. Sensitivity analysis and scenario analysis are useful tools for estimating the impact on a project's NPV due to changing the value of one capital budgeting input variable at a time. The statement is correct regarding:

- a. sensitivity analysis b. scenario analysis c. both sensitivity and scenario analysis d. none of the above

14. If two companies have the same sales volume and operating risks, they are most likely also to have identical:

- a. sales risk
b. business risk
c. sensitivity of EBIT to changes in the number of units sold
d. sensitivity of EPS to changes in the operating profit
e. none of the above

15. The idiosyncratic risk of a company is most accurately measured by the company's:

- a. beta b. financial leverage c. extent of fixed costs and demand uncertainty
d. there are multiple correct answers e. none of the above

16. Suppose a company has a current ratio of 2.5x and a quick ratio of 1.5x. If the company's current liabilities are \$100 million, the amount of inventory is closest to (in \$ million):

- a. 50 b. 100 c. 150 d. 180 e. none of the above

17. Which of the following is not a characteristic of a common equity?

- shareholders participate in the decision-making process
- it represents a claim on the company's assets
- it is mandatory for the company to disclose its financial performance to holders of common equity
- equity shareholders can vote on business decisions via proxy voting
- none of the above

18. Which of the following is not a primary goal of raising equity capital?

- to ensure that the company continues as a going concern
- to finance the company's debt-repurchase program
- to finance the purchase of long-lived assets
- to finance the companies operating costs
- none of the above

19. Which of the following is incorrect about the risk of an equity security? The risk of an equity security is:

- based on the uncertainty of its future cash flows
- based on the uncertainty of its future price
- based on the uncertainty associated with unique risk factors
- based on the standard deviation of its past dividends
- none of the above

20. Which of the following is the least likely outcome for a company to issue equity securities in the primary market:

- raise finance for managing working capital
- to increase the liquidity of the firm
- raise capital for CEO compensation
- to increase return on equity
- none of the above

21. The firm's cost of equity is a reflection of:

- investor's required rate of return
- investor's expected rate of return
- investor's compensation for bearing equity risk
- there are multiple correct options
- none of the above

22. ABC Ltd. has recently paid a dividend of \$0.58 per share. Dividends are expected to grow by 20 per cent next and 15 per cent the year after that. From the third year onward, dividends are expected to grow at 5.6 per cent per year for the foreseeable future. If the rate of return required on the stock is 8.3 per cent, the intrinsic value of the stock is closest to (in \$):

a. 26 b. 27 c. 28 d. 29

Short-answer type: 30 Marks (6 Marks per question)

1. [6 Marks] An investment promises to pay \$1000 per year (paid at the end of each year) for 10 years with an interest rate of 10% compounded annually. Estimate the investment amount required to make, below which the internal rate of return from the investment will be greater than 10% per annum.

2. [6 Marks] ABC Ltd is considering replacing a machine with a new design that will increase earnings before depreciation by \$30,000 annually. The new machine will cost \$100,000 and has an estimated life of eight years. The applicable corporate tax rate is 40%, and the project's cost of capital is 12%. The new machine will have a salvage value of \$12,000. The old machine has a book value of \$40,000 and a remaining eight-year life, after which its book value will be zero. If replaced, the old machine can be sold for \$15,000 today. Use the straight-line method for depreciation. Compute the initial and terminal cash flow. The terminal cash flow must also include operating cash flow for the final year.

3. [6 Marks] The manager of ABC Ltd. recently submitted a proposal to the board of directors regarding a new project that could potentially increase the company's profits by 55%. The project costs \$900 and saves operating costs of \$290 annually. The project's payback is 3.1 years. The project has a life of 5 years and has no salvage value upon termination. Should the project be accepted if the company falls in the 50% tax bracket and its weighted average cost of capital is 10%? The company uses the straight-line method for depreciation.

4. [6 Marks] Security p has an expected pay-off of \$10 and \$20 in states (outcomes) 1 and 2 respectively. Security q has an expected payoff of \$30 and \$10, respectively, for the two states. Your wealth is currently \$720, and the current prices of p and q are \$8 and \$9, respectively. If you decide to invest, how much will be your maximum wealth in state 1 and state 2, if you invest 100% of your wealth?

5. [10 Marks] Refer to the given (annual) data to compute the stock's beta if the market standard deviation is 0.22 and the market and the stock share +0.5 correlation. The current market price of the stock is \$50 per share.

Probability	.15	.10	.30	.20	.25
End-of-period prices	35	42	50	55	60

Part B

ECON F 315 – Comprehensive Exam

Part B – 42 Marks (Open Book)

1. [8 Marks + 6 Marks] Drilling Experts, Inc. finds and develops oil properties and then sells the successful ones to major oil refining companies. DEI is now considering a new potential field, and its geologists have developed the following data in thousands of dollars.

t = 0. A \$400 feasibility study would be conducted at $t = 0$. The results of this study would determine if the company should commence drilling operations or make no further investment and abandon the project.

t = 1. If the feasibility study indicates good potential, the firm would spend \$1,000 at $t = 1$ to drill exploratory wells. The best estimate is that there is an 80% probability that the exploratory wells would indicate good potential and thus that further work would be done, and a 20% probability that the outlook would look bad and the project would be abandoned.

t = 2. If the exploratory wells test positive, DEI would go ahead and spend \$10,000 to obtain an accurate estimate of the amount of oil in the field at $t = 2$. The best estimate now is that there is a 60% probability that the results would be very good and a 40% probability that results would be poor and the field would be abandoned.

t = 3. If the full drilling program is carried out, there is a 50% probability of finding a lot of oil and receiving a \$25,000 cash inflow at $t = 3$, and a 50% probability of finding less oil and then only receiving a \$10,000 inflow.

a. The project is considered to be quite risk and hence a hurdle rate of 20% is used. What is the project's expected NPV?

b. Calculate the project's coefficient of variation.

2. [7+7 Marks] A project with an up-front cost at $t = 0$ of \$1500 is being considered by Nationwide Pharmaceutical Corporation (NPC). (All dollars in this problem are in thousands.) The project's subsequent cash flows are critically dependent on whether a competitor's product is approved by the Food and Drug Administration. If the FDA rejects the competitive product, NPC's product will have high sales and cash flows, but if the competitive product is approved, that will negatively impact NPC. There is a 75% chance that the competitive product will be rejected, in which case NPC's expected cash flows will be \$500 at the end of each of the next seven years ($t = 1$ to 7). There is a 25% chance that the competitor's product will be approved, in which case the expected cash flows will be only \$25 at the end of each of the next seven years ($t = 1$ to 7). NPC will know for sure one year from today whether the competitor's product has been approved.

NPC is considering whether to make the investment today or to wait a year to find out about the FDA's decision. If it waits a year, the project's up-front cost at $t = 1$ will remain at \$1,500, the subsequent cash flows will remain at \$500 per year if the competitor's product is rejected and \$25 per year if the alternative product is approved. However, if NPC decides to wait, the subsequent cash flows will be received only for six years ($t = 2 \dots 7$).

- Assuming that all cash flows are discounted at 10%, if NPC chooses to wait a year before proceeding, how much will this increase or decrease the project's expected NPV in today's dollars (i.e., at $t = 0$), relative to the NPV if it proceeds today?
- Use the given data and estimate all the possible inputs required for the Black-Scholes model for pricing real option in this case. No need to compute the option price.

3. [14 Marks] ABC Ltd. is analyzing an average-risk project, and the following data have been developed. Unit sales will be constant, but the sales price should increase with inflation. Fixed costs will also be constant, but variable costs should rise with inflation. The project should last for 3 years, it will be depreciated on a straight-line basis, and there will be no salvage value. This is just one of many projects for the firm, so any losses can be used to offset gains on other firm projects. What is the project's expected NPV?

WACC	10.0%
Net investment cost (depreciable basis)	\$200,000
Units sold	50,000
Average price per unit, Year 1	\$25.00
Fixed op. cost excl. deprec. (constant)	\$150,000
Variable op. cost/unit, Year 1	\$20.20
Annual depreciation rate	33.333%
Expected inflation rate per year	5.00%
Tax rate	40.0%

END