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CA Final

Advanced Financial Management

New Questions by ICAI

Relevant for Jan 26

Latest 5 Exam Papers, RTPs & MTPs

Updated till Jan 26 MTP-2

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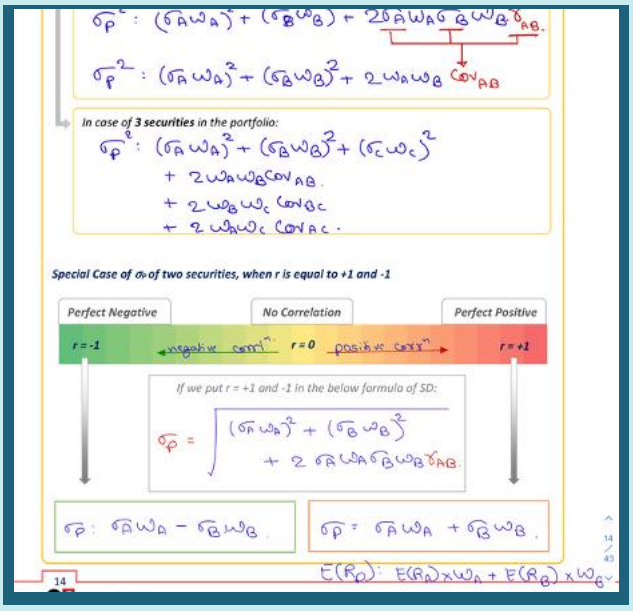

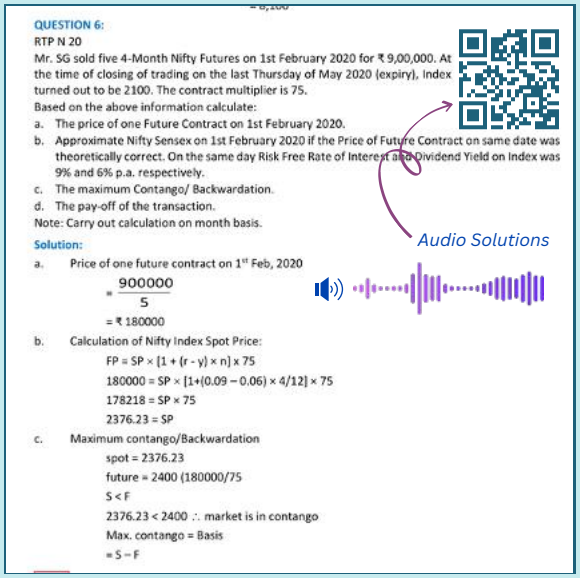

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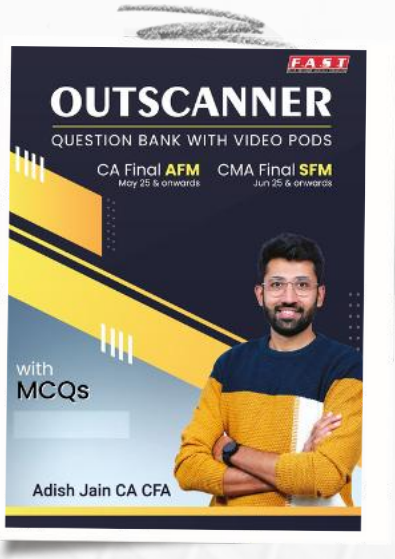

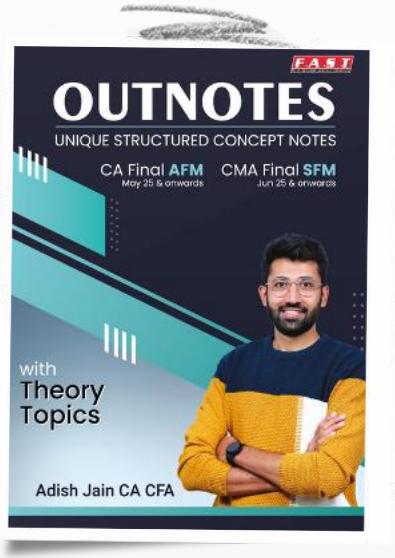

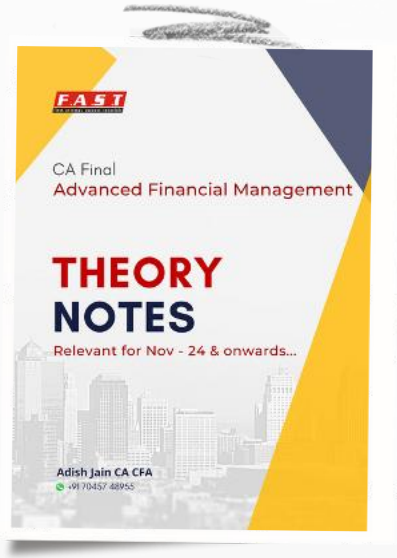

New Questions & MCQs in Exams Paper, RTPs and MTPs of Past 5 Attempts

Jan 26 – MTP

No new Questions

Jan 26 – RTP

No new Questions

Sep 25 – Exam Paper

QUESTION 1:

PN Limited submits the following details for the financial year ended on 31st March 2025:

Number of Equity Shares	1,50,000
Current market price per share	₹ 12
10% Debts	₹ 2,00,000
Cash and Cash Equivalents	₹ 5,00,000
Gross Profit	₹ 12,00,000
Indirect Expenses (Excluding Depreciation & Interest)	₹ 5,00,000
Depreciation	₹ 30,000
Risk – free rate of return	7%
Market rate of return	16%
Beta of the Company	0.8
Applicable Tax Rate	20%

On the basis of above details, you are required to calculate the following:

1. Cost of Equity of the company using CAPM.
2. Earnings Per Share (EPS) of the company.
3. Equity value of the company if applicable EBIDTA multiple is 4.
4. Enterprise Value of the company.

Calculation up to 2 decimal points.

Solution:

(i) Cost of Equity using CAPM

7% + 0.8(16% - 7%) = 14.20%

(ii) Earning Per Share (EPS)

	(₹)
Gross Profit	12,00,000
Less: Indirect Expenses	5,00,000
EBIDTA	7,00,000
Less: Depreciation	30,000
	6,70,000
Less: Interest on Debt (10% on ₹ 2,00,000)	20,000

	6,50,000
Less: Tax @20%	1,30,000
Profit After Tax (PAT)	5,20,000
Number of Equity Shares	1,50,000
Earnings Per Share (EPS)	3.47

(iii) Equity Value of the Company

EBITDA	₹ 7,00,000
EBITDA multiple	4
Capitalized Value	₹ 28,00,000
Less: Outstanding Debts	₹ 2,00,000
Equity Value	₹ 26,00,000

(iv) Enterprise Value of company

Number of Equity Shares	1,50,000
Current Market Price (CMP)	₹ 12
Market Capitalization	₹ 18,00,000
Add: Outstanding Debts	₹ 2,00,000
Less: Cash and Cash Equivalent	₹ 5,00,000
Enterprise Value	₹ 15,00,000

QUESTION 2:

The following details are given for TC and PC Limited stocks and Nifty Index for a period of one year:

	TC Limited	PC Limited	Nifty Index
Average return	0.12	0.18	0.6
Variance of return	5.8	4.8	2.10
Beta	0.8	0.7	
Proportion of allocated fund	50%	50%	

You are required to

a. Calculate the systematic and unsystematic risk for the companies'
b. Calculate portfolio risk.
c. If the of fund allocation is changed to 60:40 for TC Limited and PC Limited respectively, advise whether it is preferable or not.

Calculation up to 3 decimal points.

Solution:

(i) Calculation of Systematic Risk and Unsystematic Risk of

TC Ltd.

Systematic Risk $= \beta^2\sigma^2_M = (0.8)^2(2.10) = 1.344$

Unsystematic Risk = Total Risk – Systematic Risk

= 5.80 – 1.344 = 4.456

PC Ltd.

Systematic Risk = $\beta^2\sigma^2_M$ = $(0.7)^2(2.10)$ = 1.029

Unsystematic Risk = Total Risk – Systematic Risk

= 4.80 – 1.029 = 3.771

(ii) Portfolio Risk

Covariance of returns between any two stocks = $\beta_1\ \beta_2\ \sigma^2_m$

Accordingly, Covariance of returns between TC Ltd. and PC Ltd. shall be:

= 0.8 x 0.7 x 2.10 = 1.176

and the Portfolio Risk shall be:

σ^2_p= $(0.50)^2(5.80)$ + $(0.50)^2(4.80)$ + 2 x 1.176 x 0.50 x 0.50

σ^2_p= 1.45 + 1.20 + 0.588 = 3.238

σ_P = $\sqrt{3.238}$ = 1.80

(iii) If Fund allocation is changed to 60% and 40% then Portfolio Risk shall be

σ^2_p= $(0.60)^2(5.80)$ + $(0.40)^2(4.80)$ + 2 x 1.176 x 0.60 x 0.40

σ^2_p= 2.088 + 0.768 + 0.565 = 3.421

σ_P= $\sqrt{3.421}$ = 1.85

Exiting Return (50:50) = 0.50 X 0.12 +0.50 X 0.18 = 0.06 + 0.09 = 0.15

or 15%

New Proportion Return (60:40) = 0.60 X 0.12 +0.40 X 0.18 = 0.072 + 0.072 = 0.144 or 14.40%

It is not advisable to change the allocated fund ratio as return is decreased from 15% to 14.40% and portfolio risk is increased from 3.238 (or 1.80) to 3.421 or 3.420 (or 1.85).

Alternatively, it can also be advised based on Coefficient of Variation as follows:

Exiting = (Standard Deviation/ Mean) x 100 = (1.80/ 15) x 100 = 12%

Proposed = (Standard Deviation/ Mean) x 100 = (1.85/ 14.40) x 100 = 12.85%

Since volatility for per unit of return is higher in case of proposed allocation it is not advised.

QUESTION 3:

In 2024, Mr. Raj, an investor made a lump sum investment in an equity mutual fund that had an entry load of ₹ 0.05 per unit. By the end of the year, the NAV appreciated by 13.60%. Additionally, the fund declared a total capital gain and dividend of 5.00 per unit, which were reinvested at a year-end NAV of ₹ 25. As a result, the investor held 15,000 units at year-end.

The fund also charges an exit load of 1% if redeemed within 1 year. The investor is in the 20% tax bracket Inflation rate during the year is 4.50%.

You are required to:

1. Calculate the number of units purchased by Mr. Raj at the beginning of the investment.
2. Calculate the NAV per unit and the total investment amount made by Mr. Raj at the beginning of the year.
3. Appraise the return percentage and the real return percentage, if Mr. Raj decided to exit the investment at the end of the year.

Calculation up to 2 decimal points.

Solution:

(i) Let X be the number of units purchased at the beginning of the year, then

$X + \frac{5.00}{25.00}$ x X = 15000

X = 12,500 units

Thus, 12,500 units was purchased by Mr. Raj at the beginning of investment.

(ii) Let NAV per unit in the beginning of the year is N then

N X 1.1360 = 25, N = ₹ 22.01

Thus, NAV per unit at the beginning of the year is ₹ 22.01 and total investment made by Mr. Raj is:

= (₹ 22.01 + ₹ 0.05) x 12,500 = ₹ 2,75,750

(iii) If Mr. Raj decided to exit then Return and Real Return in percentage terms shall be computed as follows:

NAV at the end	₹ 25
No. of Units	15000
Amount Redeemable	₹ 3,75,000
Less: Exit Load	₹ 3,750
Amount Received on Redemption of Units	₹ 3,71,250
Total Amount Realized	₹ 3,71,250
Less: Initial Investment	₹ 2,75,750
Return	₹ 95,500
Less: Tax @ 20%	₹ 19,100
Net Return	₹ 76,400
Return in Percentage Terms (₹ 76,400/ ₹ 2,75,750)	27.71%
Real Return in Percentage Terms (27.71%/1.045)	26.52%
Or Real Return $\frac{1+0.2771}{1+0.045} - 1$ =	22.21%

QUESTION 4:

ABC Ltd.'s share is currently traded at the price of ₹ 192.50 per share. Mr. Roni is planning to purchase the shares of the company. For this purpose, he has taken the services of a financial analyst to know whether the price of ABC Ltd. is fairly priced. The analyst has assembled the following information:

- The before-tax required rates of return on ABC Ltd. debt, preferred stock, and common stock are 8.60%, 11%, and 13%, respectively.
- The company's target capital structure is 20% debt, 30% preferred stock and 50% Common stock.
- The market value of the company's debt is ₹ 275 million and its valued at ₹ 120 million.
- ABC Ltd. 's free cash flow to the firm (FCFF) for the year just ended is ₹ 125 million. FCFF is expected to grow at a constant rate of 8% for the foreseeable future.
- The tax rate is 30%.
- ABC Ltd. has 20 million outstanding common shares.

You are required to -

a. As a financial analyst, on the basis of value per share, advise Mr. Roni whether he should purchase the shares of the company at market price or not.

b. Assume, we are to get same value of equity as calculated in (i) for using FCFE approach, calculate free cash flow to the equity (FCFE) for the year just ended, if FCFE is expected to grow at a constant rate of 8.50% for the foreseeable future.

Calculation up to 2 decimal points.

Solution:

Working Notes:

(I) Calculation of WACC

= 8.60% (1 – 0.30) x 20% + 11% x 30% + 13% x 50%

= 11%

(II) Value of Firm based on FCFF

$= \frac{125\text{Million}(1.08)}{0.11-0.08} = \frac{135\text{Million}}{0.03}$ = ₹ 4500 Million

(i) To decide whether the value of share is justified let us compute the value per share based on FCFF as follows:

Value of Firm	₹ 4500 Million
Less: Value of Company's Debt	₹ 275 Million
Less: Value of Company's Preferred Stock	₹ 120 Million
Value of Equity Shares	₹ 4105 Million
No. of Equity Shares	20 Million
Value of Per Equity Share	₹ 205.25

Advise: Mr. Roni should purchase share at this price as it is underpriced.

(ii) Computation of Free Cash Flow to Equity

Value of one Equity Share as per FCFF ₹ 205.25

Accordingly, by using Growth Model formula we can find the FCFE per share as follows:

$205.25 = \frac{\text{FCFE}(1.085)}{0.13\text{-}0.085}$

FCFE per share = ₹ 8.51

No. of Equity Shares outstanding 20 million

FCFE of the ABC Ltd. shall be ₹ 8.51 x 20 million = ₹ 170.20 million

Alternatively, this calculation can be made on the total capital instead of per share basis as follows:

$4105 = \frac{\text{FCFE}(1.085)}{0.13\text{-}0.085}$

FCFE = ₹ 170.25 million

QUESTION 5:

Quick & Smart Inc. is a leading software development company in the UK. It has a substantial portfolio of its trade in various countries including the USA. It has recently invoiced a USA customer the sum of USD ($) 75,00,000 receivable in one year's time. Quick & Smart Inc.'s Chief Finance Officer (CFO) is considering two alternatives for hedging the exchange risk:

Alternative I: Borrowing present value of USD ($) 75,00,000 now for one year, converting the amount into GBP (£), and repaying the loan out of eventual receipts.

Alternative II: Entering into a 12 month forward exchange contract with the company's bank to sell the USD ($) 75,00,000.

The spot exchange rate is GBP (£) 1 = USD ($) 1.3288

The 12-month forward exchange rate GBP (£) 1 = USD ($) 1.3128
Interest rates for 12 months are = USA: 4.50% and UK: 5%.
You are required to calculate net proceeds in GBP (£) under both the alternatives and advise the company.
Note: Ignore bank commission and decimals.

Solution:

Alternative I

Borrowing PV of US$ 75,00,000 (US$ 75,00,000/ 1.045)	$ 71,77,033
Converting it into GBP (£) at Spot Rate	$ 1.3288
Converted Amount	£ 54,01,139
Add: Interest on the same @ 5%	£ 2,70,057
	£ 56,71,196

Alternative II

Applicable Forward Rate of 1 £	$ 1.3128
Amount Receivable in $ after one year	$ 75,00,000
Amount receivable in £ after	£ 57,12,980

Advise: Since amount receivable is higher under alternative II the company should opt for it.

Sep 25 – MTP

QUESTION 6:

XYZ Ltd., a medium-sized company in the renewable energy sector, is experiencing steady sales growth. The company's management, however, is concerned about balancing rapid growth with long-term sustainability. In the past year, XYZ's growth objectives have led to aggressive expansion plans, but management now realizes that such growth might not be financially sustainable in the long run. This raises concerns about how to maintain the company's financial health while meeting its ambitious growth targets.

The CFO of XYZ Ltd. highlights the importance of Sustainable Growth Rate (SGR).

The company now needs to ensure that its operational and financial policies align with its growth goals. XYZ must avoid expanding too quickly, which could strain its financial resources and lead to excessive borrowing. Moreover, management must also consider the long-term implications of resource consumption, particularly in the renewable energy industry, where sustainability is key to both current and future stakeholders.

XYZ Ltd. also realizes that it needs to focus on building its growth capability alongside its growth strategy. Without the necessary infrastructure and financial planning in place, the company's efforts to achieve long-term, sustainable growth could be in jeopardy. Furthermore, the company is aware of the risks of relying too much on external financing and recognizes the need for a balance between maintaining sufficient equity and minimizing debt.

Given the importance of these considerations, XYZ's management team must now review their growth strategy and financial policies to ensure they are consistent with the firm's sustainable growth objectives.

From the information given above, choose the correct answer to the following questions:

1. The concept of Sustainable Growth Rate introduced by.....
(a) Harry Markowitz
(b) William Sharpe
(c) Black Scholes
(d) Robert C. Higgins

2. The Sustainable Growth Rate (SGR) represents.....
(a) the rate at which the company can grow by issuing more equity.
(b) the maximum rate of growth in sales that can be achieved without borrowing additional funds.
(c) the growth rate determined by market demand for XYZ's products.
(d) the rate of growth determined by inflationary pressures.

3. According to the case scenario the risk associated with growing too quickly is that.....
(a) the company might not be able to retain competent staff.
(b) the company could face liquidity issues due to over-expansion.
(c) the company's stock price might decline.
(d) it could reduce the company's market share.

4. Which of the following twin cornerstones are necessary for XYZ Ltd. to achieve sustainable growth?
(a) Market conditions and competition.
(b) Growth capability and growth strategy.
(c) Product innovation and marketing strategy.
(d) Cost-cutting measures and increased sales.

5. In an inflationary condition if creditors require that XYZ Ltd.'s historical cost debt-to-equity ratio stay constant, the inflation.....
(a) reduces the need for external financing.
(b) increases the sustainable growth rate by lowering costs.
(c) lowers the sustainable growth rate.
(d) It has no effect on the company's growth rate.

QUESTION 7:

On 1 April 2015, Sunidhi was holding a portfolio of 10 securities whose value was ₹ 9,94,450, the weighted average of beta of 9 securities of the portfolio was 1.10.

Since she was expecting a fall in the prices of the shares in near future to hedge her portfolio, she sold 5 contracts of NIFTY Futures (Multiplier of 25) expiring in May 2015, which was trading at 8767.07 on 1 April.

Required:

(1) Calculate the beta of the 10th security.

(2) Reconcile the reasons in spite of 2% fall in the market as per Sunidhi's apprehension if she would have earned some profit on her cash position.

Solution:

1. First, we shall compute weighted beta of the portfolio of all 10 securities:

Let weighted beta of the Portfolio is β_P, then,

$$5 \text{ contract short} = V_p \times \frac{\beta_T - \beta_P}{F \times M}$$

$$-5 = \frac{994450 \times (0 - \beta_P)}{8767.07 \times 25}$$

β_P = 1.102 times

Now, Let beta of 10th security is β_{10} then,

1.102 = 0.90 x 1.10 + 0.10 x β_{10}

β_{10} = 1.120 times

2. The main reason for the profit in cash position might be due to reason that contrary to her expectation fall in the value of cash position there may be increase in value of cash position or decrease in the stock price may be lesser than 2%.

QUESTION 8:

SS Company is considering the replacement of its existing machine with a new machine. The Purchase price of the New machine is ₹ 26 Lakhs and its expected Life is 8 years. The company follows straight-line method of depreciation on the original investment (scrap value is not considered for the purpose of depreciation). The other expenses to be incurred for the New Machine are as under:

1. Installation Charges ₹ 9,000
2. Fees paid to the consultant for his advice to buy New Machine ₹ 6,000.
3. Additional Working Capital required ₹ 17,000. (will be released after 8 years)

The written down value of the existing machine is ₹ 76,000, and its Cash Salvage Value is ₹ 12,500. The dismantling of this machine would cost ₹ 4,500. The Annual Earnings (before tax but after depreciation) from the New Machine would amount to ₹ 3,15,000. Income tax rate is 35%. The Company's required Rate of Return is 13%.

You are required to advise on the viability of the proposal.

PVIF (13%, 8) = 0.376 PVIFA (13%, 8) = 4.80

Solution:

1. Computation of Annual Depreciation-

Particulars			₹
Purchase Price			26,00,000
Add: 1. Installation Charges			9,000
2. Fees Paid to Consultant for Advice			6,000
Total Cost of New Machine		[A]	26,15,000
Net Proceeds of Sale	(12,500 – 4,500)	[B]	8,000
Less: WDV			76,000
Capital Loss due to Sale			68,000
Tax savings on Capital Loss @35%		[C]	23,800
Working Capital Outflow		[D]	17,000
Net Initial Cash Outflow		[A - B – C + D]	26,00,200

2. Computation of Annual CFATs-

Particulars	₹
Annual Earnings	3,15,000
Less-Tax @35%	1,10,250

Earning after Tax	2,04,750
Add-Depreciation on New Machine	3,26,875
Annual Cash Savings	5,31,625

3. Computation of Net Present Value

Particulars	Period	Cash Flow (₹)	PVF @13%	PV (₹)
Initial Net Outflow	0	- 26,00,200	1	26,00,200
Annual CFAT	1-8	5,31,625	4.8	25,51,800
Working Capital Realized	8	17,000	0.376	6,392
NPV of the Proposal				(42,008)

Decision: Since NPV of the project is negative it is not viable.

Sep 25 – RTP

QUESTION 9:

In a recent Board Meeting of N Ltd. following financials of N Ltd. for the year ending 31st March 2025 were presented:

Balance Sheet as on 31.03.2025

Liabilities	₹ '000	Assets	₹ '000
Equity Capital	4,80,000	Fixed Assets	2,42,000
10% Bonds	92,000	Cash	88,000
Sundry Creditors	66,000	Sundry Debtors	1,10,000
Bills Payable	88,000	Closing Stock	3,3,0000
Other Current Liabilities	44,000		
Total Liabilities	7,70,000	Total Assets	7,70,000

Income Statement for the Year ending 31.03.2025

Particular	(₹ '000)	(₹ '000)
Sales		11,77,000
Less: Cost of Goods Sold		
Material	4,18,000	
Wages	2,64,000	
Factory Overheads	1,29,800	8,11,800
Gross Profit		3,65,200
Less: Selling & Distribution Cost	1,10,000	
Administrative Cost	1,22,800	2,32,800
Earnings Before Interest and Taxes (EBIT)		1,32,400
Less: Interest Charges		9,200
Earning Before Tax		1,23,200
Less: Taxes @ 50%		61,600
Net Profit (PAT)		**61,600**

During the Board Meeting:

(i) Director A said that the company can maintain a certain growth even though the net profit margin remains constant, and assets increases proportionately to sales and it distributes its 30% of its net profit. To maintain this growth rate, it will not require any external funds.

(ii) Director B proposed that just by maintaining a target capital structure and without issuing additional equity and maintaining target dividend pay-out ratio as proposed by Director A, more growth rate can be achieved.

(iii) Director C though agreed with views of Director A and Director B, but is of the view that in the coming year it is expected that sales is likely to rise by 15%, hence if required we can go for issue of equity shares, bonds or debentures to achieve the same growth in sales.

From the information given above, choose the correct answer to the following questions:

1. The Director A is talking about.....

(a) Internal Growth Rate

(b) Sustainable Growth Rate

(c) External Funding Requirements

(d) External Growth Rate

Ans. (a)

2. The Director B is talking about....„.....

(a) Internal Growth Rate

(b) Sustainable Growth Rate

(c) External Funding Requirements

(d) External Growth Rate

Ans. (b)

3. The Director C is talking about.....

(a) Internal Growth Rate

(b) Sustainable Growth Rate

(c) External Funding Requirements

(d) External Growth Rate

Ans. (c)

4. If we go by the proposal of Director C, then approximately…….funds shall be raised from in form of equity or debt, assuming that dividend as proposed by Director A is paid out and assets and current liabilities are increased in the same proportion as increase in sales.

(a) ₹ 1,15,500 thousand

(b) ₹ 85,800 thousand

(c) ₹ 79,332 thousand

(d) ₹ 36,212 thousand

Ans. (d)

May 25 – Exam Paper

QUESTION 10:

Equity Researchers have estimated the rate of returns for Stock A, Stock B and Market Portfolio under each state of the economy is as under:

Economy	Probability	Return on Stock A (%)	Return on Stock B (%)	Market Portfolio (%)
Boom	0.3	16	19	18

Normal	0.4	14	16	15
Recession	0.3	-9	-7	-8

The risk-free rate of return is expected to be 8%. The covariance between Stock A and the Market Portfolio is 122.70, while the covariance between Stock B and the Market Portfolio is 125.40. Assume that the CAPM framework is valid in this market.

From the information given above, choose the correct answer to the question.

1. What is the expected rate of return (percentage) for Stocks A and B?

(a) 7.70% and 9.00%

(b) 10% and 9.00%

(c) 7.70% and 10%

(d) 13.1% and 14.20%

2. What will be the variance of market portfolio?

(a) 38.4

(b) - 4.8

(c) 126.8

(d) 125.4

3. What will be the beta of Stock A and Stock B respectively?

(a) 0.9542 and 1.00

(b) 0.9862 and 1.24

(c) 0.9785 and 1.00

(d) 0.9785 and 1.24

4. Required rate of return of Stock A is _____ and Stock B is _____.

(a) 8.9785 % and 9%

(b) 9% and 8.978%

(c) 8.9875% and 9%

(d) 8.9785% and 10.4%

5. Based on calculated Alpha of Stock A and Stock B in the above case scenario, which of the following statements is correct for purchase or sale of Stock A and Stock B?

(a) Stock A has a positive alpha, and Stock B has a negative alpha. This indicates that Stock A is underpriced and Stock B is overpriced. Therefore, purchase Stock A and sell Stock B.

(b) Both Stock A and Stock B have positive alpha values, suggesting they are underpriced. Therefore, purchase both stocks.

(c) Stock A has a negative alpha, while Stock B has a positive alpha. This means Stock A is overpriced and Stock B is underpriced. Therefore, sell Stock A and purchase Stock B.

(d) Both Stock A and Stock B have negative alpha values, indicating they are overpriced. Therefore, sell both stocks.

QUESTION 11:

Steady Mutual Fund has the following assets in Scheme - Star Gold at the close of business as on 31st March, 2025:

Company	No. of Shares (units)	Market Price per share (₹)
A Ltd.	20,000	25

B Ltd.	30,000	350
C Ltd.	38,000	290
D Ltd.	50,000	400

The total numbers of units of Scheme - Star Gold are 20 lakhs. The Scheme - Star Gold has accrued expenses of ₹ 2,00,000 and other liabilities of ₹ 2,50,000.

From the information given above, choose the correct answer to the question:

1. Total gross value of the Scheme - Star Gold is -

(a) ₹ 325.00 lakhs

(b) ₹ 420.20 lakhs

(c) ₹ 480.40 lakhs

(d) ₹ 520.30 lakhs

2. Total net value of the Scheme - Star Gold is -

(a) ₹ 422.70 lakhs

(b) ₹ 420.70 lakhs

(c) ₹ 415.70 lakhs

(d) ₹ 424.70 lakhs

3. NAV per unit of the Scheme- Star Gold is-

(a) ₹ 21.135

(b) ₹ 21.035

(c) ₹ 20.785

(d) ₹ 21.235

QUESTION 12:

Mr. X, an investor buys the stocks of WBL Limited worth ₹ 21,60,000 due to very strong fundamentals. Since last 3 months, the market sentiment is weak and witnessed a significant volatility and considered to remain weak for about the next three months. Keeping in the mind volatility in the market, Mr. X is planning to hedge his portfolio in the future market. The Beta of WBL stock is 1.3 and the current value of NIFTY is 2250 and 3 months future is selling at 2310. The current market price of the WBL stock is ₹ 240. Each Nifty future can be trade in units of 240 only.

Assume there is no transaction cost and M to M Margin.

From the information given above, choose the correct answer to the question:

1. Number of future contract to be buy/sell to hedge WBL stock against expected fall in the market (rounded of contracts) -

(a) Buy 6 future contracts

(b) Sell 5 future contracts

(c) Buy 5 future contracts

(d) Sell 6 future contracts

2. If Nifty index fall by 10% from 2250 to 2025 and WBL stock falls to ₹ 212, what will be Net Gain/Loss if portfolio was hedged on NIFTY future?

(a) Net Gain ₹ 3,42,000

(b) Net Gain ₹ 3,02,100

(c) Net Gain ₹ 50,100

(d) Net Gain ₹ 90,000

3. If NIFTY index rises by 6% from 2250 to 2385 and WBL stock rises to ₹ 255, what will be Net Gain/Loss when portfolio was in hedged?

(a) Net Loss ₹ 90,000

(b) Net Gain ₹ 45,000

(c) Net Gain ₹ 1,35,000

(d) Net Gain ₹ 90,000

QUESTION 13:

ABC Ltd., a UK firm, has a receivable $ 20 Million due in 6 months. The company wants to cover full exposure. Following information are available:

Spot rate 1$ = £ 0.7720 / £ 0.7840

6 months forward rate 1$ = £ 0.7910 / £ 0.8040 Interest rates are as follows:

	US	UK
6 months deposit rate	4.50% p.a.	5.50% p.a.
6 months borrowing rate	6.00% p.a.	7.50% p.a.

Following options on pound are available:

Option	Strike rate	Price
Call	£ 0.8100	£ 0.01
Put	£ 0.8100	£ 0.02

ABC Limited has forecasted the spot rates for 6 months as follows:

Future Rates of 1$	Probability
£ 0.7800	30%.
£ 0.8100	50%
£ 0.8300	20%

From the information given above, choose the correct answer to the question:

1. What will be the total expected value of option hedge in pounds, if the full exposure of 20 Million is covered?

(a) £ 16.125 million

(b) £ 16.50 million

(c) £ 15.88 million

(d) £ 15.70 million

2. If ABC Ltd. is using forward hedge strategy, what will be total proceed in pound?

(a) £ 15.40 million

(b) £ 15.88 million

(c) £ 16.125 million

(d) £ 15.82 million

3. What will be expected spot rate at the end of 6 months and expected cost (proceed) if no hedge strategy is adopted by the company?

(a) £ 0.805/$, £ 16.10 million

(b) £ 0.85/$, £ 15.8 million
(c) £ 0.7720/$, £ 15.44 million
(d) £ 0.7910/$, £ 15.82 million

4. Identify which option gives the highest proceed.
(a) Option hedge
(b) Forward hedge
(c) Money market hedge
(d) No hedge

QUESTION 14:

BC Ltd. is contemplating on buying a new machine at ₹ 70,00,000 with an additional working capital requirement of ₹ 10,00,000. The machine is expected to have an economic useful life of 5 years, with no salvage value. The company follows the straight line method of depreciation and same is accepted for tax purposes. The machine is expected to generate an incremental increase in the before tax cash operating income of ₹ 25,00,000 (in real terms) per year for a period of 5 years.

The relevant tax rate is 35%. Inflation is expected to be 6% per year and the firms cost of capital in real term is 10% per year. Assuming that the working capital requirement will remain unchanged throughout the period, in spite of inflation.

Advise the company whether the machine should be purchased or not.

Show your NPV calculation in real term.

Calculation upto two decimal places.

PV Factor at 10% & 6% are as under:

	1	2	3	4	5
10%	0.909	0.826	0.751	0.683	0.621
6%	0.943	0.89	0.84	0.792	0.747

Solution:

1. Cash Outflow (Initial Outlay) = ₹ 70,00,000 + ₹ 10,00,000 = ₹ 80,00,000

2. Cash Flow After Tax and Present Value

Particulars	**(₹)**
Incremental cash operating income	25,00,000
Less: Taxes (0.35)	8,75,000
CFAT	16,25,000
PVAF for 5 years at 10%	3.790
PV of Cash Inflow	61,58,750

3. PV of tax shield due to Depreciation

Tax saving due to Depreciation per year	14,00,000
Tax rate	35%
Tax saving per year for five years	4,90,000

PV of tax shield due to depreciation

Years	Tax saving (Nominal)	Inflation Factor at 6%	Real Tax Saving	PVF @ 10%	PV (₹)
1	4,90,000	0.943	4,62,070	0.909	4,20,021.63
2	4,90,000	0.890	4,36,100	0.826	3,60,218.60
3	4,90,000	0.840	4,11,600	0.751	3,09,111.60
4	4,90,000	0.792	3,88,080	0.683	2,65,058.64
5	4,90,000	0.747	3,66,030	0.621	2,27,304.63
Present Value of tax shield due to Depreciation					15,81,715.10

4. PV of Release of Working Capital

	(₹)
Release of Working Capital at the end of 5th year	10,00,000
Inflation Factor at 6% at the end of 5th year	0.747
Cash Inflow in real terms	7,47,000
PVF @ 10% at the end of 5th year	0.621
Present Value of Inflow	4,63,887

5. Calculation of NPV

Particulars	Present Value (₹)
Initial Outlay	(80,00,000)
Present Value of CFAT	61,58,750
Present Value tax shield on Dep	15,81,715.10
Present Value Release of Working	4,63,887
	2,04,352.10

Recommendation**:** The Company should purchase the machine as the NPV of real cash flow is positive.

QUESTION 15:

DEF Ltd. has implemented a strategy to manage its exposure to fluctuating interest rates by engaging in both interest rate caps and floors.

The company has purchased $ 50,00,000 (i.e. call options on interest rates) cap of 8% at a premium of 0.75% of the face value to protects against rising interest rates. $ 50,00,000 (i.e. put options on interest rates) floor of 5% is also available at a premium of 0.85% of face value.

You are required to analyze the following situation:

a. If Interest rate rise to 10 percent, what is the amount received by DEF Ltd.? What are the net savings from the cap?
b. If DEF Ltd. also purchases a floor, what are net savings if interest rate rises to 10%?
c. Calculate net savings if interest rates fall to 4 percent considering cap & floor both purchase.
d. If DEF Limited has purchases the cap and sell the floor and there is price rise is 11%, what will be net saving to the company?

Solution:

(i) Premium for purchasing the Cap = 0.0075 × $ 50,00,000 = $ 37,500

Gross Payoff received on Cap (10% - 8% = 2%) i.e., $ 50,00,000 × 2/100 = $ 1,00,000

Net saving = = ($ 1,00,000 - $ 37,500) = $ 62,500

(ii) Premium for purchasing the Floor = 0.0085 × $ 50,00,000 = $ 42,500

Gross Payoff received on Cap (10% - 8% = 2%) i.e., $ 50,00,000 × 2/100 = $ 1,00,000

Net saving = $ 1,00,000 - $ 80,000 = $ 20,000

(iii) Payoff from floor $ 50,00,000 × (5% – 4%)/100 = $ 50,000

Net saving = $ 50,000 − $ 80,000 = ($ 30,000)

(iv) Sell the Floor, company will receive $ 42,500 and pay premium for Cap $ 37,500

Net premium received = $ 42,500 − $ 37,500 = $ 5,000

Gross payoff on Cap = 0.03 × $ 50,00,000

= $ 1,50,000

Net saving = $ 1,50,000 + $ 5,000

= $ 1,55,000

May 25 – MTP

QUESTION 16:

Mr. Ramesh, a 40-year-old investor, has invested ₹10,00,000 in an actively managed Equity Mutual Fund. The fund has an Expense Ratio of 2.50% and follows the Nifty 50 Index as its benchmark. Upon analyzing the Fund details, he comes across the concept of Tracking Error (TE) and finds out that the same Fund has a Tracking Error (TE) of 3.20%.

A few months later, Mr. Ramesh receives a notification that the Fund has implemented Side Pocketing. The Fund has an exposure of 15% of his investment in a debt instrument of XYZ Ltd, a company facing a severe financial crisis. Since XYZ Ltd has defaulted on its payments, the Fund Manager has moved this portion into a side pocket.

Following the decision of Fund Manager, Mr. Ramesh decides to reconsider any of the following option:

1. Should he stay invested in this Fund and wait for the Side-Pocketed assets to recover?
2. Should he switch to a Passive Index Fund that has a lower Tracking Error and lower Expense Ratio
3. Should he redeem his remaining liquid holdings and invest in a better-performing actively Managed Fund?

Based on the above scenario and given his current situation, choose the most appropriate answer for the following multiple-choice questions:

1. Is it necessary for investors to pay close attention to the Expense Ratio of a Mutual Fund because……..

A. a high expense ratio can significantly reduce net returns over time.

B. a higher expense ratio always guarantees better fund performance.

C. the expense ratio only matters in the first year of investment.

D. funds with higher expense ratios are always risk-free.

2. The Fund has been …… in replicating return on Nifty 50.

A. Successful

B. Unsuccessful

C. Can't say

D. Data is insufficient

3. After the decision of Fund Manager for side-pocketing the equivalent portion of Mr. Ramesh's investment shall_____

A. remains illiquid until the Fund Manager decides to sell it or the company recovers.

B. be immediately written off, and the Mr. Ramesh loses that portion.

C. be returned to Mr. Ramesh in proportion to his holdings.

D. be moved into a different Mutual Fund Scheme with no risk.

4. If Mr. Ramesh switches to a Passive Index Fund with an expense ratio of 0.8%, then he will save annually compared to his current Expense Ratio of 2.50%?

A. ₹ 8,000

B. ₹ 10,000

C. ₹ 17,000

D. ₹ 18,000

5. The advantage for Mr. Ramesh to switch over to a Passive Index Fund shall be____

A. lower expense ratio and lower tracking error.

B. guaranteed recovery of side-pocketed assets.

C. higher risk exposure compared to active funds.

D. avoiding capital gains tax on redemption.

QUESTION 17:

On 20.10.2024, the credit balance of an Indian bank in NOSTRO account with LMN Bank in London was £ 1,60,000 and the overbought position was £ 1,00,000. During the day, the following transactions have taken place:

Events	Time	Amount
DD Purchased	11:08	50,000
Purchased a bill on London	11:50	1,50,000
Sold forward TT	13:15	1,00,000
Forward purchased contract cancelled	13:55	50,000
Remitted by TT	14:45	85,000
Draft in London cancelled	15:00	40,000

Based on the above scenario, choose the most appropriate answer for the following multiple-choice questions:

Self-note: *Ambiguous question*

1. How much was the total amount of purchase commitments made during the day by the Indian Bank?

A. £ 2,00,000

B. £ 1,50,000

C. £ 3,40,000

D. £ 50,000

2. The final cash balance in the NOSTRO account at the end of 20.10.24 stands at …….

A. £ 85,000

B. £ 75,000

C. £ 20,000

D. £ 160,000

3. The transaction took place at …….shall affect both exchange & cash position of the bank with LMN Bank.

A. 11:08

B. 11:50

C. 14:45

D. 15:00

4. If at the end of day bank is required to maintain a credit balance of £ 20,000 in the NOSTRO account, then it……

A. shall buy forward £ 15,000

B. shall sell spot TT £ 55,000

C. shall buy spot TT £ 55,000

D. shall sell forward £ 55,000

5. If bank takes required steps to maintain a credit balance of £ 20,000 in the Nostro account, then what additional step was required to achieve the overbought position of £ 65,000?

A. Buying forward £ 15,000

B. Selling forward £ 65,000

C. Buying forward £ 60,000

D. Selling forward £ 15,000

QUESTION 18:

Zenith Capital, a boutique investment firm, manages portfolios for high-net-worth individuals (HNIs). Their lead portfolio manager, Mr. R, has been closely analyzing market trends to optimize returns for their fixed-income portfolio. Over the past few months, he has observed fluctuations in interest rates and anticipates a significant shift in the near future.

To optimise returns, Mr. R is considering three different investment strategies for clients having ₹ 10 crore of fund and are interested in Fixed Income Portfolio. Each strategy is designed to align with the client's risk appetite and future liquidity needs.

Strategy A: Investing the entire ₹ 10 crore in a single bond with a 7-year maturity to match a specific financial obligation in the future.

Strategy B: Allocating ₹ 5 crore in short-term bonds (1-year maturity) and ₹ 5 crore in long-term bonds (7-year maturity) to balance risk and return.

Strategy C: Spreading the ₹ 10 crore investment equally across bonds with maturities of 1 to 5 years to ensure periodic liquidity.

Meanwhile, Mr. R is also considering forecasting models to predict interest rate movements. He is evaluating economic indicators such as inflation, historical rate trends, and a combination of multiple economic factors to enhance the firm's forecasting accuracy.

Mr. R suggested Strategy B for Mr. H (a HNI) having a sum of ₹ 10 crore for investment in Fixed Income Portfolio. As per the strategy half amount on fund is proposed to be invested in 7-year bonds yielding 8% per annum and balance in 1-year short term bond yielding 6% per annum. Interest on these bonds is compounded annually.

Based on the above case scenario, choose the correct answer to the following questions:

1. What is the primary objective of an active bond portfolio strategy?

A. To maintain a fixed return irrespective of market conditions

B. To outperform the market by making informed investment decisions

C. To minimize volatility and ensure steady returns

D. To invest in government bonds only

2. If any HNI follows Strategy A, then ……of fixed-income portfolio strategy is being followed.

A. Barbell Strategy

B. Ladder Strategy

C. Bullet Strategy

D. Duration Matching

3. In the Barbell Strategy, the funds are typically allocated……..

A. by making entire investment in bonds with the same maturity period.

B. by dividing investment equally between short-term and long-term bonds.

C. by dividing equal amount in bonds with different maturity periods.

D. by investing only in short-term bonds.

4. In the ladder Strategy, the funds are typically allocated…….

A. by making entire investment in bonds with the same maturity period.

B. by dividing investment equally between short-term and long-term bonds.

C. by dividing equal amount in bonds with different maturity periods.

D. by investing only in short-term bonds.

5. It is expected that interest rate in coming 8 years are expected to fall by 25 bps each year and if Mr. H does not withdraw any amount from the Fund during these 7 years the total value of the investment at the end of the 7th year shall be approximately……

A. ₹ 15.036 crore

B. ₹ 15.721 crore

C. ₹ 15.739 crore

D. ₹ 15.829 crore

QUESTION 19:

An American institutional investor is exploring investment opportunities in different countries. Before proceeding, they believe a thorough analysis of options in the securities available to ensure a higher return while minimizing risk.

To achieve this objective, it formed a team consisting of following persons with respective assigned tasks:

Mr. A – He is entrusted with the task of analysing various Macro-economic factors e.g. historical performance of the economies in the past/ present and expectations in future, growth of different sectors of the economies in future with signs of stagnation/degradation at present. In addition to that he also analysed the trends in peoples' income and expenditure.

Ms. B – After receiving inputs/ recommendations from Mr. A she is entrusted with the task of assessment regarding all the conditions and factors relating to demand of the particular product, cost structure of the industry and other economic and Government constraints in the same country.

Mr. C – After receiving inputs/ recommendations from Ms. B he is entrusted with the task of careful examination of the company's quantitative and qualitative fundamentals. Which includes a comparison of price earning ratios of different

companies. Further, In addition to examine the financial solvency, liquidity of the company he is also advised for the evaluation of future growth prospects of the company identified.

Based on the above case scenario, choose the correct answer to the following questions:

1. If Mr. A want to evaluate the impact of macroeconomic trends on their potential investment. Which of the following factors is least likely to influence their decision?

A. Growth rates of national income

B. Inflation rates

C. Market speculation trends

D. Barometer indicators

2. The investor learns that inflation is expected to rise. Based on economic analysis, how might this affect their stock investment decision?

A. Stock prices are expected to decline due to reduced consumer demand

B. Stock prices are expected to rise as stocks act as a hedge against inflation

C. Stock prices will remain unaffected as inflation only affects bond markets

D. Stock prices will become highly volatile, but long-term growth remains unchanged

3. Which of the techniques shall be primarily used by Ms. B to carry out the required analysis at his part?

A. Anticipatory Surveys

B. Indicator Approach

C. Input-Output Analysis

D. Decision Tree Analysis

4. Mr. A while analyzing industry growth, finds that certain indicators tend to peak before the economy's overall growth. These indicators are best classified as.....

A. Lagging indicators

B. Leading indicators

C. Coincidental indicators

D. Random indicators

5. Specifically, the team of Mr. A, Ms. B, and Mr. C are entrusted with the task of carrying out.....

A. Fundamental Analysis

B. Technical Analysis

C. Market Analysis

D. Security Analysis

May 25 – RTP

QUESTION 20:

ABC, a large business house is planning to sell its wholly owned subsidiary KLM. Another large business entity XYZ has expressed its interest in making a bid for KLM. XYZ expects that after acquisition the annual earning of KLM will increase by 10%.

Following information, ignoring any potential synergistic benefits arising out of possible acquisitions, are available:

a. Profit after tax for KLM for the financial year which has just ended is estimated to be ₹ 10 crore.

b. KLM's after tax profit has an increasing trend of 7% each year and the same is expected to continue.

c. Estimated post tax market return is 10% and risk free rate is 4%. These rates are expected to continue.

d. Corporate tax rate is 30%

	XYZ	ABC	Proxy entity for KLM in the same line of business
No. of shares	100 lakhs	80 lakhs	--
Current share price (₹)	287	375	--
Dividend pay out	40%	50%	50%
Debt : Equity at market values	1 : 2	1 : 3	1:4
P/E ratio	10	13	12
Equity beta	1	1. 1	1.1

Assume gearing level of KLM to be the same as for ABC and a debt beta of zero.

You are required to calculate:

a. Appropriate cost of equity for KLM based on the data available for the proxy entity.

b. A range of values for KLM both before and after any potential synergistic benefits to XYZ of the acquisition.

c. Compute the market value of KLM as a part of ABC.

Note: Round off calculation up to 2 decimal and compute figure in ₹ crores.

Solution:

(a) To calculate cost of equity for KLM first we shall calculate β of KLM as follows:

β (equity ungeared for the proxy company) = 1.1 X 4 / [4 + (1 – 0.3)] = 0.94

0.94 = β equity geared X 3/ [3 + (1 - 0.3)]

β equity geared = 1.16

Cost of equity = 0.04 + 1.16 X (0.10 – 0.04)

= 10.96%

(b) Based on the data available range of valuation can be computed using P/E and dividend-based valuation approach.

(i) P/E valuation

(Based on earning of ₹ 10 Crore)

	Using proxy entity's P/E	**Using XYZ's P/E**
Pre synergistic value	= 12 X ₹ 10 Crore = ₹ 120 Crore	= 10 X ₹ 10 Crore = ₹ 100 Crore
Post synergistic value	= 12 X ₹ 10 Crore X 1.1 = ₹ 132 Crore	= 10 X ₹ 10 Crore X 1.1 = ₹ 110 Crore

(ii) Divided valuation model

	Based on 50% pay-out	Based on 40% pay-out
Pre synergistic value	$= \frac{0.5 \times 10 \times 1.07}{0.1096-0.07}$ = ₹ 135.10 Crore	$= \frac{0.4 \times 10 \times 1.07}{0.1096-0.07}$ = ₹ 108.08 Crore
Post synergistic value	$= \frac{0.5 \times 10 \times 1.1 \times 1.07}{0.1096-0.07}$ = ₹ 148.61 Crore	$= \frac{0.4 \times 10 \times 1.1 \times 1.07}{0.1096-0.07}$ = ₹ 118.89 Crore

(c) Market Price

Although no information is available about the value of KLM, it may be possible to calculate a market value based on proportion of earnings of ABC that is generated by KLM.

Market value of ABC = 80 Lakh Shares X ₹ 375 = ₹ 300 Crore

Post-tax earnings of ABC = ₹ 300 crore/13 = ₹ 23.08 Crore

If market value of ABC is allocated to KLM in the proportion of relative earning of KLM to that of ABC, KLM would have a market value of ₹ 300 crore X [10/23.08] = ₹ 129.98 Crore.

KLM's Post Tax earning = ₹ 10 Crore.

If ABC's P/E ratio is applied to it, the market value of KLM becomes ₹ 10 Crore X 13 = ₹ 130 Crore.

Nov 24 – Exam Paper

QUESTION 21:

Z Ltd. paid a dividend of 5 for the current year. The dividend is expected to grow at 25% for the next 6 years and at 10% per annum thereafter. The return of government bond is 13% per annum and market return is expected to be around 20%. The correlation between market return and Z Ltd. share return is 0.3733. The standard deviation of market return and Z Ltd. shares is 12% and 18% respectively.

Round off to two decimal places.

From the information given above, choose the correct answer to the Question no. 1 to 5:

1. What is the intrinsic value of Z Ltd. shares?

A. **₹156.69**
B. ₹303.14
C. ₹349.62
D. ₹341.30

2. What is the present value at the end of 4th year?

A. ₹23.71
B. ₹12.56
C. **₹6.53**
D. ₹6.99

3. What is the expected return of Z Ltd shares?
A. 15%
B. 23.92%
C. **16.92%**
D. 16.5%

4. What is value in perpetuity at the start of the 6th year?
A. ₹156.69
B. **₹303.14**
C. ₹ 349.62
D. ₹341.30

5. If current market price of the shares is 315 than stock is
A. **Over valued**
B. Under valued
C. Fairley valued
D. Cannot be determined

QUESTION 22:

The following information is available in respect of Bond 1 and Bond 2

	Bond 1	Bond 2
Face value, redeemable value at par	₹1000	₹1000
Coupon rate, payable annually (%)	6%	10%
Time to maturity (years)	5	3

An investor has the portfolio consisting of 75% of Bond 1 and 25% of Bond 2. The current YTMs prevailing in the market is 10%.

Year (n):	1	2	3	4	5
PVIF (10%, n):	0.9091	0.8264	0.7513	0.6830	0.6209

From the information given above, choose the correct answer to the Question no. 6 to 9:

1. New price of the portfolio if YTM changes from 10% of 10.5% based on the duration is:
A. **₹ 870.12**
B. ₹ 902.36
C. ₹ 1832.23
D. ₹ 1864.45

2. What should be the price and duration of Bond-2?
A. ₹ 826.43 and 2.49
B. **₹ 1,000 and 2.74**
C. ₹ 924.85 and 2.74
D. ₹ 1000 and 2.49

3. What should be the price and duration of Bond – 1?
A **₹ 848.34 and 4.43**

B. ₹ 811.09 and 4.38
C. ₹ 1,227.44 and 4.43
D. ₹ 658.15 and 3.90.

4. What will be the price sensitivity of the portfolio?
   A. -4.027
   B. -2.491
   C. **-3.643**
   D. -3.981

QUESTION 23:

Based on the following information, choose the correct answer from the following questions:

Situation	Action	Exercise Price	Premium	Spot Price
I	Exercised	140	20	160
II	Exercised	200	15	175
III	Lapsed	300	25	400

From the information given above, choose the correct answer to the Question no. 10 to 12:

1. In Situation III, the investor's position and the amount of profit / loss is:
A. **Put option, ₹(25)**
B. Call option, ₹75
C. Short position, ₹100
D. Long position, ₹(100)

2. In situation I, the investor's position and amount of profit or loss is:
A. Put option and ₹20
B. **Call option and ₹0**
C. Put option and ₹0
D. Call option and ₹20

3. In situation II, the investor's position and the amount of profit / loss is:
A. **Put option and ₹10**
B. Call option and ₹10
C. Put option and ₹25
D. Call option and ₹25

QUESTION 24:

The following is the data regarding Three Securities.

Stock	Expected Return (%)	Std. deviation	Correlation with the Market return
A	19%	2.50	0.840
B	13.50%	2.00	0.540
C	11.00%	0.80	0.975
Market risk	-	1.20	-

Market rate of return	14.00%	-	-
Risk tree rate	9.00%	-	-

a. Advise which of the above stocks are over, under or correctly valued in the market?

b. What will be strategy would you like to recommend?

Solution:

a) Calculation of Beta and Required rate of return:

Security	Beta	Required rate of return: $R_j = R_f + \beta (R_m - R_f)$
A	$= \frac{0.840 \times 2.50}{1.20} = 1.75$	= 9% + 1.75 (14% - 9%) = 17.75%
B	$= \frac{0.540 \times 2.00}{1.20} = 0.90$	= 9% + 0.90 (14% - 9%) = 13.50%
C	$= \frac{0.975 \times 2.00}{1.20} = 0.65$	= 9% + 0.65 (14% -b%) = 12.25%

Stock	Required rate of return %	Expected rate of return%	valuation
A	17.75%	19.00%	Under Valued
B	13.50%	13.50%	Correctly Valued
C	12.25%	11.00%	Over Valued

b) Strategy:

Stock	Decision
A	Buy
B	Hold
C	Sell

QUESTION 25:

Mr. X invested ₹ 1,00,000 at a face value of ₹ 10 per unit in a dividend reinvestment plan in a mutual fund during its initial public offering on 1st July, 2022. On 31st March, 2023, the mutual fund declared a dividend of 10%. At that time Mr. X calculated his holding period return to be 115%.

On 31st March, 2024 the mutual fund declared a dividend of 20% and Mr. X redeemed all his investment and calculated his holding period return to be 193.134%.

You are required to calculate

a. The NAVs as on 31.03.2023 and 31.03.2024.

b. Calculate the total units redeemed.

Solution:

a) **Calculation of NAV on 31st March 2023 (NAV_1):**

Number of units on 1st July 2022 (n_0) = 1,00,000/10 = 10,000 units

Dividend reinvested = 10,000 × 10 × 10% = ₹ 10,000

Number of units reinvested $= \frac{10,000}{NAV_1}$

Number of units on 31st March 2023 (n_1) $= 10,000 + \frac{10,000}{NAV_1}$

Now, calculation of NAV_1:

$$\text{Holding Yield} = \frac{(NAV_1 \times n_1) - (NAV_0 \times n_0)}{(NAV_0 \times n_0)} \times 100$$

$$115 = \frac{(NAV_1 \times [10{,}000 + \frac{10{,}000}{NAV_1}]) - 1{,}00{,}000}{1{,}00{,}000} \times 100$$

$$NAV_1 = ₹\ 20.5$$

Calculation of NAV on 31st match 2024 (NAV_2):

Number of units on 31st March 2023 (n_1) $= 10{,}000 + \frac{10{,}000}{20.5}$

$= 10{,}487.80$ units

Dividend reinvested $= 10{,}487.8 \times 10 \times 20\% = ₹\ 20{,}975.6$

Number of units reinvested $= \frac{20{,}975.6}{NAV_2}$

Number of units on 31st March 2024 (n_2) $= 10{,}487.8 + \frac{20{,}975.6}{NAV_2}$

Now, calculation of NAV_2:

$$\text{Holding Yield} = \frac{(NAV_2 \times n_2) - (NAV_0 \times n_0)}{(NAV_0 \times n_0)} \times 100$$

$$193.134 = \frac{(NAV_2 \times [10{,}487.8 + \frac{20{,}975.6}{NAV_2}]) - 1{,}00{,}000}{1{,}00{,}000} \times 100$$

$$NAV_2 = ₹\ 25.95$$

b) Number of units redeemed on 31st March 2024 (n_2) $= 10{,}487.8 + \frac{20{,}975.6}{25.95}$

$= 11{,}296.11$ units

QUESTION 26:

PQ Ltd. expects sales of ₹ 100 lakhs in the year 1. The same will increase by ₹ 20 lakhs per year over the next four years. At the end of 5 years the project would be wound up. The Deprecation will be charged at 20% p.a. on straight line method.

The expenses excluding the depreciation will be 40% of the sales. There will be no salvage value of the plant. PQ Ltd. proposes to invest in the plant an amount where the Net Present Value will be Zero.

Corporate Tax rate is 30%.

You are required to calculate the investment which can be made in the plant.

Solution:

Self-note: The question is missing the data of discounting rate. That is why suggested answer has solved the question without calculating PV of future cash inflows. Alternatively, the question can also be solved assuming any other discounting rate.

Expected Sales & Cost excluding depreciation (₹ Lakhs)

Year	Expected Sales	Expected expenses @ 40%
1	100	40

2	120	48
3	140	56
4	160	64
5	180	72

Cash Inflow from the Project

Let the cost of the plant = P

The, Depreciation per year = 0.20P

Accordingly, annual CFAT will be (₹ Lakhs):

Year	Sales	Expenses	Depn	PBT	Tax @ 30%	PAT	Depn	CFAT
1	100	40	0.20P	60 – 0.20P	18 - 0.06P	42 – 0.14P	0.20P	42+ 0.06P
2	120	48	0.20P	72 – 0.20P	21.6 – 0.06P	50.4 – 0.14P	0.20P	50.40 + 0.06P
3	140	56	0.20P	84 – 0.20P	25.2 – 0.06P	58.8 – 0.14P	0.20P	58.80 + 0.06P
4	160	64	0.20P	96 – 0.20P	28.8 – 0.06P	67.2 – 0.14P	0.20P	67.20 + 0.06P
5	180	72	0.20P	108 – 0.20P	32.4 – 0.06P	75.6 – 0.14P	0.20P	75.60 + 0.06P
PV of Net Cash Inflows								294 + 0.30P

For NPV to be zero, PV of Cash OF (i.e., investment in plant) = PV of Cash Inflows

Accordingly, P = 294 + 0.30P

P = 420

Thus, the required investment to be made in plant shall be ₹420 lakhs.

QUESTION 27:

XY Ltd. is planning to expand its operations in view of growing demand for its products. For this purpose, it is considering to borrow an amount of ₹ 100 crores for a period of 3 months in the coming 6 months' time from now. The current rate of interest is 8% per annum but due to inflation it may go up in 6 months' time. The company wants to hedge itself against the likely increase in interest rate.

The company's Bankers quoted an FRA (Forward Rate Agreement) at 8.20% per annum.

You are required to calculate due to FRA:

a. The actual interest rate if the Banker pays to XY Ltd. an amount of ₹ 9,78,952.52

b. The actual interest rate if XY Ltd. will pay to the Banker a sum of ₹ 9,80,872.98

Solution:

a) Position of XY Ltd = Long i.e., Contract to borrow.

Self-note: Since, XY Ltd had a gain on settlement, it means that FR would be lower than RR. It means RR – FR i.e., gain would be a positive number.

Calculation of actual interest rate (RR):

$$\text{Gain} = \frac{NP \times (RR - FR) \times n/12)}{1 + RR \times n/12}$$

$$9,78,952.52 = \frac{1,00,00,00,000 \times (RR - 0.082) \times 3/12}{1 + RR \times 3/12}$$

RR = 0.086 or 8.6%

b) Position of XY Ltd = Long i.e., Contract to borrow.

Self-note: Since, XY Ltd had a loss on settlement, it means that FR would be higher than RR. It means RR – FR i.e., loss would be a negative number.

Calculation of actual interest rate (RR):

$$-9,80,872.98 = \frac{1,00,00,00,000 \times (RR - 0.082) \times 3/12}{1 + RR \times 3/12}$$

RR = 0.078 or 7.8%

QUESTION 28:

Economic Value Added (EVA) of ABC Ltd was ₹ 31,10,000.
Following is the capital structure of ABC Ltd. at the end of current financial year:

Equity (Share Capital + Reserves & Surplus)	₹ 170 lakhs
Debt (Coupon Rate 10%)	₹ 80 lakhs
Invested Capital	₹ 250 lakhs

Following data is given to estimate the cost of equity capital:

Beta of ABC Ltd.	0.90
Risk-free rate (i.e. current yield on Govt. Bonds)	8%
Average market risk premium	10%

Economic Value Added (EVA) of ABC Ltd was ₹ 31,10,000.
The applicable corporate income tax rate is 30%.
You are required to calculate the Profit After Tax of ABC Ltd.

Solution:

Calculation of WACC:

$k_e = R_f + \beta \times (R_m - R_f)$

$= 8 + 0.90 \times 10 = 17\%$

$k_d = 10 \times (1 - 0.30) = 7.00\%$

$WACC = 17 \times \frac{170}{250} + 7 \times \frac{80}{250} = 13.80\%$

Now, calculating EBIT using EVA:

EVA = EBIT × (1 - t) – Invested Capital × WACC

31,10,000 = [EBIT × (1 – 0.3)] – (2,50,00,000 x 0.1380)

EBIT = ₹ 93,71,429

Calculation of profit after Tax (₹)

Operating Profit	93,71,429
Less: Interest	8,00,000
Profit before Tax	85,71,429
Less: Tax @ 30%	25,71,429
Profit after Tax	60,00,000

QUESTION 29:

PQR Ltd. is considering a project in US, which involve an initial investment of ₹ 124.50 Crore. The project will have useful life of 5 years. Current spot exchange rate is INR/USD is 83. The risk free rate in US is 4.186 % and the same in India is 6.9768%. Cash inflows in USD from the project are as follows

Year	1	2	3	4	5
Cash inflow	30,00,000	40,00,000	50,00,000	60,00,000	70,00,000

PQR Ltd. is expecting net surplus of 1858.08 lakh to be received after closure of the project. There is no salvage value. PQR Ltd. want to take a forward cover to protect itself from exchange rate fluctuations.

n	1	2	3	4	5
PVIF(6.976%, n)	0.935	0.874	0.817	0.764	0.714
PVIF(4.186%,n)	0.959	0.921	0.884	0.849	0.815
PVIF(12%, n)	0.893	0.797	0.712	0.636	0.567
PVIF(15%, n)	0.870	0.756	0.658	0.572	0.497

You are required to recommend the INR/USD rate for the forward cover?

Solution:

Self-note: This question has following ambiguities:

1. *The data of discounting rate is missing in the question which is why institute has made a random assumption of 12%. Alternatively, some other rate may also be assumed.*
2. *The $ cash flows of all the years are to be converted to rupee using same ₹/$ forward rate.*
3. *Amount of ₹ 1858.08 lakh does not seem to be NPV based on its language given in question.*

Let the ₹/$ forward rate for every year be F.

Annual Cash inflows (in lakhs):

Year	$ CFs	₹ CFs
1	30.00	30.00F
2	40.00	40.00F
3	50.00	50.00F
4	60.00	60.00F
5	70.00	70.00F

Back-calculating the Forward rate (F) using NPV assuming a discount rate of 12% (₹ lakhs):

Year	CFs	PVF@12%	DCFs
0	- 12450	1.00	- 12450
1	30F	0.893	26.79F
2	40F	0.797	31.88F
3	50F	0.712	35.60F
4	60F	0.636	38.16F
5	70F	0.567	39.69F
			172.12F - 12450

Now, NPV = 172.12F – 12450

1858.08 = 172.12F – 12450

F = 83.13

Recommendation: Forward cover the rate of ₹/$ 83.13 is recommended.

QUESTION 30:

Mohan buys 10,000 shares of X Ltd. @ ₹ 25 per share whose beta value is 1.5 and sells 5,000 shares of A Ltd. @₹ 40 per share having a beta value of 2. He obtains a complete hedge by buying 25 Nifty Futures. He closes out his position

at the closing price of the next day when the share of X Ltd. has fallen by 4% and Nifty Futures has dropped by 2.50%. In the process he suffered a loss of ₹ 16,625.

You are required to determine

a. The value of the Nifty future
b. Initial cash outlay
c. Cash inflow at the close out
d. Percentage Gain/ loss to Shares of A Ltd. at the time of closure
e. Price of A Ltd on closure.

Solution:

a) Position and MV of holdings:

Security	position	No. of shares	MPS	Market Value	Beta
X	Long	10,000	25	2,50,000	1.5
A	Short	- 5,000	40	- 2,00,000	2
Net PF Value				50,000	

$\beta_p = \frac{\beta_X \times MV_X + \beta_A \times MV_A}{MV_X + MV_A}$

$= \frac{1.5 \times 2,50,000 + 2 \times (-2,00,000)}{2,50,000 + (-2,00,000)}$

= - 0.5 times

Calculating price of futures using hedging formula:

No. of contract $= V_P \times \frac{\beta_T - \beta_P}{F \times M}$

+ 25 $= \frac{50,000 \times (0 - (-0.5)}{P_F}$

P_F = ₹ 1,000

b) Initial Cash Outlay = 2,50,000 + (-2,00,000) + (1,000 × 25)
= 75,000

Self-note: Position in futures ideally should not be considered in Cash Outlay. But suggested answer has done it.

c) Cash Inflow at closeout:
Profit/(loss) = IF at close out – Initial OF
- 16,625 = IF – 75,000
IF = 58,375

d) Gain loss on share A

	Total Loss			16,625
Less:	Loss on X	(2.5L × 4%) =	10,000	
	Less: Loss on Futures (25 × 1,000 × 2.5%)		=	625
	Loss on A			₹ 6,000

Loss in % $= \frac{6,000}{2,00,000} = 3\%$

e) Price on closure = 40 + 3% = ₹ 41.2

QUESTION 31:

A Portfolio Manager (PM) has three mutual funds in his portfolio. Following are the details of these three mutual funds:

Particulars	Growth fund	Balanced fund	Regular fund	Market
Average Return (%)	7.5	6.3	5.4	
Variance				50.41
Sharpe Ratio	-0.15	-0.36	-0.48	
Treynor's Ratio	-2	-3	-4.80	

The yield on 182 days Treasury bill is 9 per cent per annum.

You are required to calculate

a. Variance of the Funds

b. Coefficient of Determination of the Funds

Solution:

	Growth	Balanced	Regular
a) Sharpe Ratio $= \frac{E(r)-R_f}{\sigma_p}$	$-0.15 = \frac{7.5-9}{\sigma_G}$ $\sigma_G = 10\%$ $\sigma_G^2 = 100\%$	$-0.36 = \frac{6.3-9}{\sigma_B}$ $\sigma_B = 7.5\%$ $\sigma_B^2 = 56.25\%$	$-0.48 = \frac{5.4-9}{\sigma_R}$ $\sigma_R = 7.5\%$ $\sigma_R^2 = 56.25\%$
b) Treynor ratio $= \frac{E(R)-R_f}{\beta_p}$	$-2 = \frac{7.5-9}{\beta_G}$ $\beta_G = 0.75$ times	$-3 = \frac{7.5-9}{\beta_B}$ $\beta_B = 0.9$ times	$-4.8 = \frac{7.5-9}{\beta_R}$ $\beta_R = 0.75$ times
$\beta_s = r_{(s,m)} \times \frac{\sigma_s}{\sigma_m}$	$0.75 = r_{G,m} \times \frac{10}{7.1}$ $r_{G,m} = 0.5325$	$0.9 = r_{B,m} \times \frac{7.5}{7.1}$ $r_{B,m} = 0.852$	$0.75 = r_{R,m} \times \frac{7.5}{7.1}$ $r_{R,m} = 0.710$
Coefficient of determination	$r_{G,m}^2 = 0.2836$	$r_{B,m}^2 = 0.7259$	$r_{R,m}^2 = 0.504$

QUESTION 32:

True Life Inc., a US based company, has won a contract to implement a project in India. The project will require an initial investment of ₹ 8000 million. The whole project along with the equipment will be sold to the Indian Government for ₹ 9600 million in one-year time. Since the Indian Government will pay for the amount in Indian Rupee (₹), the company is worried about exposure due to exchange rate volatility.

a. Construct a swap that will help the True Life Inc. to reduce the exchange rate risk.

b. Assume that the Indian Government offers a swap at spot rate which is INR/USD 80 in one year. The spot rate after one year is expected to be INR/USD 84. Further, you may also assume that the True Life Inc. can also take a USD loan at 6% per annum.

ADVISE whether the company should opt for this option or just do nothing.

Solution:

(i) The following swap arrangement can be entered by True Life Inc.

(1) Swap a US$ loan today at an agreed rate with any party to obtain Indian Rupees (₹) to make initial investment.

(2) After one year swap back the Indian Rupees with US$ at the agreed rate. In Such Case the company is exposed only on the profit earned from the project.

(ii) **With the Swap**

	Year 0 (Million US$)	Year 1 (Million US$)
Buy ₹8000 million at spot rate of 1 USS = ₹80	(100.00)	--------
Swap ₹8000 million back at agreed rate of ₹ 80		100.00
sell ₹1600 million at 1 US$ = ₹84		19.05
Interest on $100 loan @6% for one year		(6.00)
	(100.00)	**113.05**

Net result is a net receipt of IJS$ 13.05 million

Without the swap

	Year 0 (Million US$)	Year 1 (Million US$)
Buy 8000 million at spot rate of 1 1US$ = ₹80	(100.00)	
Sell 9600 million at 1 US$ = ₹84		114.29
Interest on $100 loan @6% for one year		(6.00)
	(100.00)	**108.29**

Net result is a net receipt of US$ 8.29 million.

Decision: Since the net receipt is higher in swap option the company should opt for the same.

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QUESTION 33:

The Asset Management Company of the mutual fund (MF) has declared a dividend of 9.98% on the units under the dividend reinvestment plan for the year ended 31st March 2021. The investors are issued additional units for the dividend at the rate of closing Net Asset Value (NAV) for the year as per the conditions of the scheme.

The closing NAV was ₹ 24.95 as on 31st March 2021. An investor Mr. X who is having 20,800 units at the year-end has made an investment in the units before the declaration of the dividend at the rate of opening NAV plus an entry load of ₹ 0.04. The NAV has appreciated by 25% during the year.

Assume the face value of the unit as ₹ 10.00.

Based on above Case Scenario, answer the following questions:

1. The Opening NAV of the Asset Management Company shall be ……

(a) ₹ 20.24

(b) ₹ 19.96

(c) ₹ 18.75

(d) ₹ 17.65

Ans. (b)

2. The Number of the units purchased shall be ……

(a) 18750

(b) 17500
(c) 20450
(d) 20000
Ans. (d)

3. Original amount of the investment shall be ……
(a) ₹ 4,00,000
(b) ₹ 6,50,000
(c) ₹ 3,55,000
(d) ₹ 5,65,000
Ans. (a)

4. Which of the following statement about Expense ratio is/ are incorrect:
(i) It is the percentage of income that were spent to run a mutual fund.
(ii) It includes advisory fees, travel costs, registrar fees , custodian fees, etc.
(iii) It includes Brokerage costs for trading of Portfolio.
(iv) High Expense Ratio can seriously undermine the performance of a mutual fund scheme.
(a) (i), (ii), (iii)
(b) (i), (iii)
(c) only (iii)
(d) only (i)
Ans. (c)

5 . ……considers and uses downside deviation instead of total standard deviation in denominator.
(a) Expense Ratio
(b) Sharpe Ratio
(c) Treynor Ratio
(d) Sortino Ratio
Ans. (d)

QUESTION 34:

Suppose you are a risk manager at a financial institution, and your company has loaned a significant amount of ₹ 500 crore to a company X Ltd. for a period of 3 years at 6-month at MCLR plus 200 bps. You are concerned about X Ltd.'s ability to repay the debt due to recent market volatility. To protect your institution from potential default, you decide to purchase a Credit Default Swap (CDS) from ABC Bank Ltd. for same notional amount at a premium quoted at 1% per year through cash settlement.
On the respective reset dates for the same period actual MCLR interest rate comes out as follows:

Reset	MCLR
1	9.75%
2	10.00%
3	10.25%
4	10.35%
5	10.50%
6	10.60%

Based on above case scenario answer the following questions:
1. The primary purpose of a Credit Default Swap (CDS) is.....
(a) to increase the value of bonds.

(b) to protect against default risk of a debt obligation.
(c) to provide guaranteed profit to the buyer.
(d) to create a new form of loan.
Ans. (b)

2. Which of the following statements is true about CDS contracts?
(a) CDS contracts cannot be used for speculation.
(b) CDS contracts are governed by government regulations.
(c) CDS contracts are private agreements between two parties.
(d) CDS contracts eliminate all risks for the buyer.
Ans. (c)

3. Which organization publishes the guidelines and rules for conducting Credit Default Swap transactions?
(a) Federal Reserve
(b) International Swap and Derivative Association (ISDA)
(c) Securities and Exchange Commission (SEC)
(d) World Trade Organization (WTO)
Ans. (b)

4. Assuming no default occurs the total premium your company will pay during the designated loan period shall be.....
(a) ₹ 5 crore
(b) ₹ 10 crore
(c) ₹ 15 crore
(d) ₹ 30 crore
Ans. (c)

5. Suppose if the lender defaults somewhere in the beginning of third year of loan (after payment of interest upto 2 years) and the market value of a reference loans falls to 75% of its par value, then ABC Bank will pay your company .....in a cash settlement.
(a) ₹ 15 crore
(b) ₹ 30 crore
(c) ₹ 125 crore
(d) ₹ 500 crore
Ans. (c)

QUESTION 35:

You are an investment analyst working for a financial advisory firm. You have been asked to analyze the bond market's yield curve to assist your clients in making investment decisions. The yield curve represents the relationship between the interest rates (yield) and the time to maturity for debt securities, usually government bonds.
For simplicity, assume the following yield data for government bonds over various maturities (measured in years):
Yield Curve Table

Maturity (Years)	Yield (%)
1 Year	3.00%
2 Years	4.00%
3 Years	5.00%
5 Years	6.00%
7 Years	6.40%

10 Years	7.00%
15 Years	7.40%
30 Years	7.60%

Based on above case scenario answer the following questions:

1. The main characteristic of a normal yield curve is…….

(a) Short-term yields are higher than long-term yields.

(b) Short-term yields are lower than long-term yields.

(c) Yields remain the same across all maturities.

(d) Yields fluctuate randomly over different maturities.

Ans. (b)

2. Based on the revised yield data, what is the yield spread between the 10-year bond and the 1-year bond?

(a) 2.0%

(b) 3.5%

(c) 4.0%

(d) 5.0%

Ans. (c)

3. An inverted yield curve typically indicates……

(a) Economic growth

(b) Economic uncertainty

(c) An upcoming recession

(d) Inflationary pressure

Ans. (c)

4. If an investor is looking to invest for 2 years starting 3 years from now, the forward rate he would expect shall be……

(a) 7.41%

(b) 7.52%

(c) 7.76%

(d) 7.93%

Ans. (b)

5. If an investor is looking to invest for 2 years starting 5 years from now, the forward rate he would expect shall be……

(a) 7.41%

(b) 7.52%

(c) 7.76%

(d) 7.93%

Ans. (a)

QUESTION 36:

You as an investor purchased a 4-month European Call Option on the equity shares of X Ltd. for ₹ 10, of which the current market price is ₹ 132 per share and the exercise price ₹ 150. You expect the price to range between ₹ 120 to ₹ 190. The expected share price of X Ltd. and related probability is given below:

Expected Price (₹)	120	140	160	180	190
Probability	0.05	0.20	0.50	0.10	0.15

Based on above case scenario answer the following questions:

1. Expected price of share of X Ltd. at the end of 4 months shall be…….

a. ₹ 160.00
b. ₹ 160.50
c. ₹ 158.00
d. ₹ 140.00

2. Suppose if the exercise price prevails at the end of 4 months the Value of Call Option shall be……

a. ₹ 0
b. ₹ 18
c. ₹ 10
d. ₹ 14

3. In case the option is held to its maturity, the expected value of the call option shall be……

a. ₹ 0
b. ₹ 18
c. ₹ 10
d. ₹ 14

4. In the given different scenarios of expected prices of share of X Ltd. at the time of maturity the option shall be in-the-money in …… scenarios.

a. two
b. three
c. five
d. In none of the scenario

5. In the given different scenarios of expected prices of share of X Ltd. at the time of maturity the option shall be at-the-money in …… scenarios.

a. two
b. three
c. five
d. In none of the scenario

QUESTION 37:

The ABC Startup has the following expected profits (₹) under different scenarios along respective probabilities

Year	Best Case		Base Case		Worst Case	
	Revenue	Expenses	Revenue	Expenses	Revenue	Expenses
1	100,00,000	80,00,000	100,00,000	90,00,000	100,00,000	95,00,000
2	120,00,000	92,40,000	110,00,000	95,70,000	102,00,000	98,94,000
3	144,00,000	108,00,000	121,00,000	102,85,000	104,04,000	101,95,920
Probability	30%		60%		10%	

You are required to suggest the value of ABC Startup using First Chicago Method assuming that:

a. Applicable discounting rate is 20%.
b. Startup is located in Tax-free Zone.
c. The multiple for Terminal is 10.
d. No depreciable assets are held by the ABC Startup.

Note:

1. Present Value Factor (PVF)

Year	**1**	**2**	**3**
PVF@20%	0.8333	0.6944	0.5787

2. Round off the calculation to whole numbers.

Solution:

Valuation of Startup under different scenarios:

a) Best Case Scenario

	Year 1	Year 2	Year 3	
Revenue	₹ 1,00,00,000	₹ 1,20,00,000	₹ 1,44,00,000	
Expenses	₹ 80,00,000	₹ 92,40,000	₹ 1,08,00,000	
Cash Flow/ Earnings	₹ 20,00,000	₹ 27,60,000	₹ 36,00,000	
Terminal Value				₹ 3,60,00,000
PVF @ 20%	0.8333	0.6944	0.5787	0.5787
PV	₹ 16,66,600	₹ 19,16,544	₹ 20,83,320	₹ 2,08,33,200
Value of Startup				₹ 2,64,99,664

b) Base Case Scenario

	Year 1	Year 2	Year 3	
Revenue	₹ 1,00,00,000	₹ 1,10,00,000	₹ 1,21,00,000	
Expenses	₹ 90,00,000	₹ 95,70,000	₹ 1,02,85,000	
Cash Flow/ Earnings	₹ 10,00,000	₹ 14,30,000	₹ 18,15,000	
Terminal Value				₹ 1,81,50,000
PVF @ 20%	0.8333	0.6944	0.5787	0.5787
PV	₹ 8,33,300	₹ 9,92,992	₹ 10,50,341	₹ 1,05,03,405
Value of Startup				₹ 1,33,80,038

c) Worst Case Scenario

	Year 1	Year 2	Year 3	
Revenue	₹ 1,00,00,000	₹ 1,02,00,000	₹ 1,04,04,000	
Expenses	₹ 95,00,000	₹ 98,94,000	₹ 1,01,95,920	
Cash Flow/ Earnings	₹ 5,00,000	₹ 3,06,000	₹ 2,08,080	
Terminal Value				₹ 20,80,800
PVF @ 20%	0.8333	0.6944	0.5787	0.5787
PV	₹ 4,16,650	₹ 2,12,486	₹ 1,20,416	₹ 12,04,159
Value of Startup				₹ 19,53,711

Value of ABC Startup as per First Chicago Method:

= 0.30 x ₹ 2,64,99,664 + 0.60 x ₹ 133,80,038 + 0.10 x ₹ 19,53,711

= ₹ 1,61,73,293

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QUESTION 38:

Two friends, Mr. A and Mr. N were discussing about the risks of market. While Mr. A is sort of risk averse, Mr. N is an aggressive investor and believes in taking risk.

Mr. N said we cannot diversify the market risk at all, and he quoted the Modern Portfolio Approach. Both friends analyze the market data for the few months and came out with expected returns on two stocks for a particular market.

Market Return	Aggressive	Defensive
7%	4%	9%
25%	40%	18%

Based on the above scenario, answer the following questions:

1. The Beta of Defensive stock is……

(a) 2
(b) 0.5
(c) 4
(d) 1

Ans. (b)

2. If the market return is equally likely to be 7% or 25% then expected return of Aggressive stock shall be……..

(a) 18%
(b) 13.50%
(c) 22%
(d) 11%

Ans. (c)

3. The Alpha of the Defensive stocks is……..

(a) -10%
(b) 22%
(c) 5.50%
(d) 12%

Ans. (c)

4. The Modern Portfolio Theory was propounded by ……

(a) William Sharpe
(b) Black Scholes
(c) Stephen Ross
(d) Harry Markowitz

Ans. (d)

5. As per Capital Market Line (CML) Theory the Portfolios lying on the CML over the market portfolio are called …….

(a) Lending Portfolios
(b) Borrowing Portfolios
(c) Diversified Portfolios
(d) Risk- Free Portfolios

Ans. (c)

May 24 – Exam Paper

No new questions

May 24 – MTP

QUESTION 39:

ABC Ltd. is planning to expand its business and therefore raising fund by issuing a convertible bond of ₹ 10 crore. An investor "Mr. X" is interested to invest in the bond of ABC Ltd. Mr. X has following data related to the convertible bond.

The data given below relates to a convertible bond:

Face value	₹ 250
Coupon rate	12%
No. of shares per bond	20
Market price of share	₹ 12
Straight value of bond	₹ 235
Market price of convertible bond	₹ 265
Maturity	5 Years

You, being an expert of the matter, are required to answer his questions. Select the most appropriate alternative:

1. The percentage of downside risk of the bond is approximately……..

(a) 10.42%

(b) 6.38%

(c) 2.13%

(d) **12.77%**

2. The conversion premium in percentage term of the bond is……..

(a) 12.77%

(b) **10.42%**

(c) 2.18%

(d) 13.45%

3. The conversion parity price of the stock is…….

(a) ₹ 11.75

(b) ₹ 12.00

(c) **₹ 13.25**

(d) ₹ 12.50

4. If he wants a yield of 15% the maximum price he should be ready to pay for is…… .

(a) 217.41

(b) **224.81**

(c) 240.00

(d) 232.32

QUESTION 40:

Suppose you are a financial consultant and following 3 clients have approached to you seeking advise on the investment to be made in securities. All these clients have different background and risk appetite as well as perception to the market.

- Client A wants to invest in Fixed income avenues and therefore he is looking at the credit rating of the securities as well as financial ratios such as interest coverage, earning power etc and the general prospect of the industry.
- Client B wants to earn a fixed income over a period of time by holding the security till its maturity.
- Client C wants to earn more by taking more risk. Therefore, he is more interested to invest in stocks. He believes that Price reflects all information found in the record of past prices and volumes.

On the basis of above information, choose the most appropriate answer to the MCQs.

1. The main factor to be considered in selecting fixed income avenue for client A shall be……..

(a) Yield to maturity
(b) **Risk of Default**
(c) Tax Shield
(d) Liquidity

2. The main factor that have to be evaluated in the selection of Bond for Client B shall be……..

(a) **Yield to maturity**
(b) Risk of Default
(c) Tax Shield
(d) Liquidity

3. If Weak form efficiency is prevailing in the market then which approach is best for selection of Equity Shares?

(a) Technical Analysis
(b) **Fundamental Analysis**
(c) Random selection Analysis
(d) None of the above.

QUESTION 41:

On the basis of the following information:

Current dividend (Do) = ₹5
Discount rate (k) = 10.5%
Growth rate (g) = 4%

(i) Calculate the present value of stock of ABC Ltd.
(ii) Evaluate whether the stock is overvalued if stock price is ₹ 70, ROE = 18% and EPS (E_0) = ₹ 4.50 applying:
(1) PE Multiple Approach and
(2) Earning Growth Model (using discount rate of 10.5%).

Solution:

(i) Present Value of the stock of ABC Ltd. is:-

$$Vo = \frac{5(1.04)}{0.105-0.04} = ₹80/-$$

(ii) (A) Value of stock under the PE Multiple Approach

Particulars	
Actual Stock Price	₹ 70.00
Return on equity	18%

EPS	₹ 4.50
PE Multiple (1/Return on Equity) = 1/18%	5.56
Market Price per Share	₹ 25.02

Since, Actual Stock Price is higher, hence it is overvalued.

(B) Value of the Stock under the Earnings Growth Model

Particulars	
Actual Stock Price	₹ 70.00
Return on equity	18%
EPS	₹ 4.50
Growth Rate	4%
Market Price per Share [EPS ×(1+g)]/(Ke – g)	₹ 72
= ₹ 4.50x 1.04 / (0.105-0.04)	

Since, Actual Stock Price is lower, hence it is slightly undervalued.

QUESTION 42:

A US parent company has subsidiaries in France, Germany, UK and Italy. The amounts due to and from the affiliates is converted into a common currency viz. US dollar and entered in the following matrix.

Inter Subsidiary Payments Matrix (US $ Thousands)

		Paying affiliate				
		France	Germany	UK	Italy	**Total**
Receiving affiliate	France	---	80	120	200	400
	Germany	120	---	80	160	360
	UK	160	120	---	140	420
	Italy	200	60	120	---	380
	Total	480	260	320	500	**1560**

The treasurer of US Parent company is suggesting that by applying Multilateral Netting system the company can save a lot of transfer/ exchange costs. The company's Board agreed with Treasurer's proposal.

From the above case scenario, choose the most appropriate answer of following MCQs.

1. Before applying Multilateral Netting it is necessary to apply…….

A. Unilateral Netting

B. Bilateral Netting

C. Multilateral Netting

D. Interest Rate Swapping

2. Through Multinational Netting these transfers will be reduced to ……..

A. $ 50,000

B. $ 100,000

C. $ 150,000

D. $ 200,000

3. The Net Payment/ Net Receipts for France after netting off shall be……

A. Net Receipt $ 40,000

B. Net Payment $ 80,000
C. Net Payment $ 40,000
D. Net Receipt $ 80,000

4. The Net Payment/ Net Receipts for Italy after netting off shall be…….
A. Net Receipt $ 60,000
B. Net Payment $ 120,000
C. Net Payment $ 60,000
D. Net Receipt $ 120,000

5. Suppose if the transfer charges are 0.01% of the amount transferred then by applying multilateral netting techniques there will be reduction in overall cost of transfer by ……
A. US $ 136
B. US $ 156
C. US $ 1,360
D. US $ 1,560

QUESTION 43:

Your client is holding the following securities:

Particulars of Securities	Cost	Dividends/ Interest	Market price at the end of holding period	Beta
	₹	₹	₹	
Equity Shares:				
G Ltd.	20,000	1,450	19,600	0.6
S Ltd.	30,000	1,000	30,400	0.8
B Ltd.	28,000	1,400	32,000	0.6
GOI Bonds	72,000	5,060	71,980	0.01

Evaluate:
a. Risk free rate of return.
b. Expected rate of return of each security (except GOI Bond), using the Capital Asset Pricing Model (CAPM).
Note:
(1) Use weighted average Beta in calculations.
(2) Round off calculations upto 3 decimal points.

Solution:

Particulars of Securities	Cost ₹	Market Price	Capital gain	Dividend/ Interest
G Ltd.	20,000	19,600	?400	1,450
S Ltd.	30,000	30,400	400	1,000
B Ltd.	28,000	32,000	4,000	1,400
GOI Bonds	72,000	71,980	?20	5,060
Total	1,50,000	1,53,980	3,980	8,910

a) Risk free return [Return on Govt. Security (GOI Bond)]

$$= \frac{5,060+(72,000-71,980)}{72,000} = 7\%$$

b) Weighted Average of Beta

= 0.6 x 19,600/1,53,980 + 0.8 x 30,400/1,53,980
+ 0.60 x 32,000/1,53,980 + 0.01 x 71,980/1,53,980
= 0.364

Average Return on Portfolio = (8,910+3,980) / 1,50,000 x 100% = 8.593%

Calculating Market Return:

$8.593\% = 7\% + (R_m - 7\%) \times 0.364$

$R_m = 11.376\%$

Expected Rate of Return for each security is

Rate of Return = $Rf + \beta (Rm - Rf)$

G Ltd. = $7 + 0.6 (11.376 - 7)$ = 9.626%

S Ltd. = $7 + 0.8 (11.376 - 7)$ = 10.501%

B Ltd. = $7 + 0.6 (11.376 - 7)$ = 9.626%

QUESTION 44:

A mutual fund company introduces two schemes i.e. Dividend plan (Plan-D) and Bonus plan (Plan-B). The face value of the unit is ₹ 10. On 1-4-2018 Mr. K invested ₹ 2,00,000 each in Plan-D and Plan-B when the NAV was ₹ 38.20 and ₹ 35.60 respectively. Both the plans matured on 31-3-2023.

Particulars of dividend and bonus declared over the period are as follows:

Date	Dividend %	Bonus Ratio	Net Asset Value (₹)	
			Plan D	Plan B
30-09-2018	10	---	39.10	35.60
30-06-2019	---	1:5	41.15	36.25
31-03-2020	15	---	44.20	33.10
15-09-2021	13	---	45.05	37.25
30-10-2021	---	1:8	42.70	38.30
27-03-2022	16	---	44.80	39.10
11-04-2022	---	1:10	40.25	38.90
31-03-2023	---	---	40.40	39.70

Evaluate the Effective Yield Per Annum in respect of the above two plans.

Note:

1. Use following PV Factors:

PVIF (2%,5) = 0.9057, PVIF (4%,5) = 0.8219, PVIF (8%,5) = 0.6806, PVIF (13%,5) = 0.5428

2. Round off calculations upto 2 decimal points.

Solution:

Plan – D

Unit acquired = $\frac{2,00,000}{38.20}$ = 5235.60

Date	Units held	Dividend		Re- investment Rate	New Units	Total Units
		%	Amount			
01.04.2018						5235.60
30.09.2018	5235.60	10	5235.60	39.10	133.90	5369.50
31.03.2020	5369.50	15	8054.25	44.20	182.22	5551.72
15.09.2021	5551.72	13	7217.24	45.05	160.20	5711.92
27.03.2022	5711.92	16	9139.07	44.80	204.00	5915.92
31.03.2023	Maturity Value	(₹ 40.40 X 5915.92)				₹ 2,39,003.17

Approximate Effective Yield = $\frac{2,39,003.17 - 2,00,000}{2,00,000} \times \frac{1}{5} \times 100$

= 3.90%

Now more accurate effective yield can be computed by using the IRR method as follows:

At Rate of: PV of Maturity Value is:

2% → 2,16,465.17

? = 3.64% ← 2,00,000.00
4% → 1,96,436.71
Accurate Effective Yield = 3.64%

Plan – B

Date	Particulars	Calculation Working	No. of Units	NAV (₹)
01.04.2018	Investment	₹ 2,00,000/35.60 =	5617.98	35.60
30.06.2019	Bonus	5617.98/5 =	1123.60	36.25
			6741.58	
30.10.2021	"	6741.58/8 =	842.70	38.30
			7584.28	
11.04.2022	"	7584.28/10 =	758.43	38.90
			8342.71	
31.03.2023	Maturity Value	8342.71 x ₹ 39.70 =		3,31,205.59

Approximate Effective Yield $= \frac{1,31,205.59}{2,00,000} X \frac{1}{5} X 100$

= 13.12%

Now more accurate effective yield can be computed by using the IRR method as follows:

At Rate of: PV of Maturity Value is:
8% → 2,25,418.52
? = 10.78% ← 2,00,000.00
13% → 1,79,778.39
Accurate Effective Yield = 10.78%

May 24 – RTP

QUESTION 45:

Grow More Ltd. an NBFC is in the need of funds and hence it sold its receivables to MAC Financial Corporation (MFC) for ₹ 100 million. MFC created a trust for this purpose called General Investment Trust (GIT) through which it issued securities carrying a different level of risk and return to the investors. Further, this structure also permits the GIT to reinvest surplus funds for short term as per their requirement.

MFC also appointed a third party, Safeguard Pvt. Ltd. (SPL) to collect the payment due from obligor(s) and passes it to GIT. It will also follow up with defaulting obligor and if required initiate appropriate legal action against them.

Based on above scenario, answer the following questions:

1. The securitized instrument issued for ₹ 100 million by the GIT falls under category of …….

A. Pass Through certificate (PTCs)
B. Pay Through Security (PTS)
C. Stripped Security
D. Debt Fund.

2. In the above scenario, the Originator is……

A. Grow More Ltd.
B. MAC Financial Corporation (MFC)
C. General Investment Trust (GIT)
D. Safeguard Pvt. Ltd.

3. In the above scenario, the General Investment Trust (GIT) is a/an……

A. Obligor
B. Originator
C. Special Purpose Vehicle (SPV)
D. Receiving and Paying Agent (RPA)

5. In the above scenario, the Safeguard Pvt. Ltd. (SPL) is a/an……
A. Obligor
B. Originator
C. Special Purpose Vehicle (SPV)
D. Receiving and Paying Agent (RPA)

6. Which of the following statement holds true?
A. When Yield to Maturity in market rises, prices of Principle Only (PO) Securities tend to rise.
B. When Yield to Maturity in market rises, prices of Principle Only (PO) Securities tend to fall.
C. When Yield to Maturity in market falls, prices of Principle Only (PO) Securities tend to fall.
D. **When Yield to Maturity in market falls, prices of Principle Only (PO) Securities remain the same.**

QUESTION 46:

You are a financial analyst at a prominent investment firm and have been tasked with empirically verifying the weak form of Efficient Market Hypothesis (EMH) Theory for the XYZ Stock Index, a collection of diverse stocks. You decided to conduct three different tests to assess whether the stock market follows the principles of the weak form of EMH.

Test 1:
For the past five years, you collected daily price changes of the stocks in the XYZ Stock Index. You calculated correlation coefficients for different lag periods and analyzed whether past price changes exhibit any significant correlation with future price changes. You considered price changes to be serially independent. The results indicated that most auto correlation coefficients are close to zero and statistically insignificant, suggesting those past price changes do not predict future price changes.

Test 2:
You further investigated the randomness of price changes in the XYZ Stock Index. Analyzing the sequence of daily price changes, you count the number of runs where price changes are consistently positive or negative. Upon comparing the observed number of runs with the expected number based on randomness, you find that they align closely, supporting the idea that price changes follow a random pattern.

Test 3:
To examine the efficacy of trading strategies based on historical price trends, you implemented a simple trading rule for the XYZ Stock Index. The rule involves buying when the price crosses a moving average of 5% threshold and selling when it crosses another 7% threshold. Over a period of testing, you computed the returns generated by the trading strategy. The results revealed that the returns are not consistently better than random chance, implying that past price trends do not reliably predict future price movements.

Conclusion:
After conducting the three tests the evidence supports the weak form of Efficient Market Theory for the XYZ Stock Index you concluded that past price trends do not reliably predict future price movements.

Based on the above information answer the following questions:
1. Test 1 is ……
A. **Serial Correlation test**

B. Filter Rules test
C. Run test
D. Variance Ratio test

2. Test 2 is ……
A. Serial Correlation test
B. Filter Rules test
C. Run test
D. Variance Ratio test

3. Test 3 is ……
A. Serial Correlation test
B. Filter Rules test
C. Run test
D. Variance Ratio test.

4. The Filter Rule Test should not be applied for buy and hold strategy if…….
A. the behaviour of stock price changes is predictable.
B. the behaviour of stock price changes is dependent on past trends.
C. the behaviour of stock price changes is correlated.
D. the behaviour of stock price changes is random.

5. Results of your studies support the……
A. Semi-strong EMH Theory
B. Strong EMH Theory
C. Random Walk Theory
D. Markowitz Theory

QUESTION 47:

Mr. Amit is happy with the investment in a company as it is paying good dividend for the last few years. Last year it paid a dividend of ₹ 2 per share. The share is currently trading at ₹ 150 per share. He is of view that if he applies dividend discount model, the share is undervalued. As a financial expert examine his view that dividend discount model represents the fair value.

You being an expert is required to evaluate the market value of the share of the company.

Profit after tax of the company	₹ 290 crores
Equity capital of company	₹ 1,300 crores
Par value of share	₹ 40 each
Debt ratio of company (Debt/ Debt + Equity)	27%
Long run growth rate of the company	8%
Beta 0.1; risk free interest rate	8.7%
Market returns	10.3%
Capital expenditure per share	₹ 47
Depreciation per share	₹ 39
Change in Working capital	₹ 3.45 per share

Note: Round off figures (e.g. EPS etc.) upto 2 decimal points.

Solution:

No. of Shares $= \frac{₹\ 1,300\ crores}{₹\ 40} = 32.50$ Crores

EPS $= \frac{PAT}{No.\ of\ shares} = \frac{290crores}{32.5crores} = ₹8.92$

Calculation of value per share using Free Cash Flow to Equity as basis:

FCFE = Net income – [(1-b) (capex – dep) + (1-b) (ΔWC)]

= 8.92 – [(1-0.27) (47-39) + (1-0.27) (3.45)]

= ₹ 0.564

$K_e = R_f + ß\ (R_m - R_f)$

= 8.7 + 0.1 (10.3 – 8.7) = 8.86%

$Po = \frac{FCFE(1+g)}{K_e-g} = \frac{0.56(1.08)}{0.0886 - 0.08} = ₹\ 70.33$

Calculation of value per share using dividend discount model:

$Po = \frac{D_{0(1+g)}}{K_e - g} = \frac{2(1.08)}{0.0886-.08} = ₹\ 251.16$

From the above we can see that value per share on the basis of dividend discount model is more than the value per share on the basis of free cash flow to equity model.

In the dividend discount model, the analyst considers the stream of expected dividends to value the company's stock. It is assumed that the company follows a consistent dividend payout ratio which can be less than the actual cash available with the firm.

A stock's intrinsic value based on the dividend discount model may not represent the fair value for the shareholders because dividends are distributed in the form of cash from profits. In case the company is maintaining healthy cash in its balance sheet then it means that dividend pay-out is low which could result in undervaluation of the stock.

In the case of free cash flow to equity model a stock is valued on the cash flow available for distribution after all the reinvestment needs of capex and incremental working capital are met. Thus, using the free cash flow to equity model provides a better measure for valuations in comparison to the dividend discount model.

Thus, the view of Mr. Amit that dividend discount model represents the fair value is incorrect. The share is not under-valued rather it is overvalued if we take "free cash flow to equity model" into consideration.

Nov 23 – Exam paper

QUESTION 48:

An investor has categorized all the available stock in the market into the following types and the estimated weights of the categories of stocks in the market index are given below. Further, the sensitivity of returns of these categories of stocks to two factors Inflation and Stock Market are also given below:

Category	Weight in Market Index	Factor 1 (Inflation)			Factor 2 (Stock Market)		
		Beta 1	Expected Value (%)	Actual Value (%)	Beta 2	Expected Value (%)	Actual Value (%)
Small Cap	20%	1.2	6.7	6.7	0.8	10	10.5
Medium Cap	30%	1.75	4.5	6	0.9	7	8
Large Cap	15%	1.3	6.75	8	1.165	9	10

Flexi Cap	35%	1.7	7	6.5	0.85	8.85	9.75

Risk Free Rate of Interest is 7.50%.

Round off to 2 decimals.

You are required to calculate:

a. Expected return on the market index for both the factors.

b. Expected return on the market index under Arbitrage Pricing Theory (Existing Scenario)

c. Expected return on the market index under Arbitrage Pricing Theory, if the composition of the Portfolio is changed to 25% equally in all four categories.

d. Which alternative (Existing or Changed) will be more profitable?

Solution:

a. E(R) on market index for Factor 1 $= 6.7 \times 0.2 + 4.5 \times 0.3 + 6.75 \times 0.15 + 7 \times 0.35$
$= 6.15\%$

E(R) on market index for Factor 2 $= 10 \times 0.2 + 7 \times 0.3 + 9 \times 0.15 + 8.85 \times 0.35$
$= 8.55\%$

b. $E(R_m)$ using arbitrage pricing theory:

$E(R) = R_f + \beta_1 \times RFP_1 + \beta_2 \times RFP_2 + \beta_3 \times RFP_3$

Small Cap: $= 7.5 + 1.2 (6.7 - 6.7) + 0.8 (10.5 - 10) = 7.9\%$

Medium Cap $= 7.5 + 1.75 (6 - 4.5) + 0.9 (8 - 7) = 11.03\%$

Large Cap $= 7.5 + 1.3 (8 - 6.75) + 1.165 (10 - 9) = 10.29\%$

Flexi Cap $= 7.5 + 1.7 (6.5 - 7) + 0.85 (9.75 - 8.85) = 7.42\%$

E(R) on market index $= 7.9 \times 0.2 + 11.03 \times 0.3 + 10.29 \times 0.15 + 7.42 \times 0.35$
$= 9.03\%$

c. E(R) on market index at equal weight:

$= 7.9 \times 0.25 + 11.03 \times 0.25 + 10.29 \times 0.25 + 7.42 \times 0.25$
$= 9.16\%$

d. Changed alternative (investing 25% equally in all four categories,) is more profitable than existing composition since it has higher rate of expected return.

QUESTION 49:

The following information is available pertaining to shares of Omni Limited:

Current Market Price	₹ 420
Strike Price	₹ 450
Maximum Price in 3m time	₹ 525
Minimum Price in in 3m time	₹ 378
Continuously Compounded Rate of Return (p.a.) (%)	8%
e^{rt}	1.0202

a. Calculate the 3 months call option by using Binomial Method and Risk Neutral Method. Are the calculated values under both the models are same?

b. What will be the value as per binomial model if given option is a put option?

c. State also clearly the basis of Valuation of options under these models.

Solution:

a. Value of option using Binomial Model:

Binomial Tree:

At month 0	At month 3	Call payoff	Put Payoff
S_0 = 420 Exercise price = 450	S_u = 525	75	0
	S_d = 378	0	72

Delta of Call: $= \frac{75 - 0}{525 - 378} = 0.5102$

Risk-less hedged portfolio will be: 0.5102 share of Omni Ltd Long & 1 Call option short

Let the value of Call option be X

Particulars	Today		At the end of 3m		
	Action	Amount	Action	525	378
0.5102 shares	Buy	214.28	Sell	267.86	192.86
1 call option	Sell	(X)	Settle	(75)	(0)
Total OF		214.28 - X	Total IF	192.86	192.86

Value of investment today = PF of Future CFs

$$214.28 - X = \frac{192.86}{e^{rt}}$$

$$214.28 - X = \frac{192.86}{1.0202}$$

$$X = 25.24$$

Value of call option (X) = ₹ 25.24

Value of option using Risk Neutral Model:

Binomial Tree:

At month 0		At month 3	Call payoff	Put Payoff
S_0 = 420 Exercise price = 450	p = 0.3434	S_u = 525	75	0
	(1-p) = 0.6566	S_d = 378	0	72

Calculation of $R = e^{rt} = e^{0.08 \times 3/12} = e^{0.02} = 1.0202$

$$420 = \frac{p \times 525 + (1 - p) \times 378}{1.0202}$$

P = 34.34%

1 – P = 1 – 34.34% = 65.66%

$$V_C = \frac{75 \times 0.3434 + 0 \times 0.6566}{1.0202} = ₹ 25.25$$

Value of call option (X) = ₹ 25.24

Conclusion: Value of option under both the model is same.

b. Delta of Put: $= \frac{0 - 72}{525 - 378} = 0.4898$

Risk-less hedged portfolio will be: 0.4898 share of Omni Ltd Long & 1 Put option Long

Let the value of Put option be X

Particulars	Today		At the end of 3m		
	Action	Amount	Action	525	378
0.4898 shares	Buy	205.72	Sell	257.14	185.14
1 put option	Buy	X	Settle	0	72
Total OF		205.72 + X	Total IF	257.14	257.14

Value of investment today = PF of Future CFs

$$205.72 + X = \frac{257.14}{e^{rt}}$$

$$205.72 + X = \frac{257.14}{1.0202}$$

$$X = 46.33$$

Value of put option is ₹ 46.33

c. Basis of valuation of Options:

- Binomial model uses an approach called "Risk less Hedge Approach" to find the price of the option, by creating a portfolio which will have same value at expiration irrespective of any price. Hedge means to create an equal and opposite position for protecting the value of portfolio.
- In Risk Neutral Model, valuation of options is based on arbitrage and is therefore independent of risk preferences; one should be able to value options assuming any set of risk preferences and get the same answer.

QUESTION 50:

Mr. K has invested in three Mutual fund schemes as per details below:

Particulars	MF A	MF B	MF C
Date of investment	01.06.2022	01.07.2022	01.08.2022
Net Asset Value (NAV) at entry date	₹ 11	₹ 10.5	₹ 12
Dividend received upto 31-03-2023	₹ 12,500	₹ 17,000	₹ 4,000
NAV as at 31-03-2023	₹ 11.25	₹ 11.48	₹ 10.80
Increase/(Decrease) in NAV (₹)	₹ 22,727,27	₹ 93,333.33	(₹ 50,000)
Effective Yield per annum	4.2296%	14.6978%	-13.8190%

Ignore Entry/Exit load expenditure.

Assume 365 days in a year. Round off the investment to nearest ₹100.

You are required to calculate:

a. The amount of investment made initially by Mr. S in these schemes.

b. Number of units invested in the three schemes by Mr. S.

Advise also whether he can continue to hold this investment or can he redeem now.

Solution:

Amount of investment & number of units invested

Particulars	MF A	MF B	MF C

(a)	Opening NAV (₹)	₹ 11	₹ 10.5	₹ 12
(b)	Closing NAV (₹)	₹ 11.25	₹ 11.48	₹ 10.80
(c)	Increase in NAV per unit (₹) [b – a]	₹ 0.25	₹ 0.98	(₹ 1.20)
(d)	Total Inc./(Dec.) in NAV (₹)	22,727,27	93,333.33	(50,000)
(e)	No. of units invested [d/c]	90,909.08	95,238.09	41,666.67
(f)	Amount of Investment [a x e]	10,00,000	10,00,000	5,00,000

Advice: Since there is no entry and exit load, he can sell the MF B and MF C and continue to hold investment in MF A.

QUESTION 51:

A Japanese company imports hi-tech printer cartridges from US worth $ 1 million. The chief financial officer of the company wishes to know the best strategy for protection against uncertainty, for the payment that has to be made at the end of 3 months. Financial team of the company has collected the following options for evaluation:

Table 1: Exchange rates quoted in Forex Market:

¥/$ Quotation	Bid Price	Ask Price
Spot rates	146.03	146.63
3m Forward	144.03	145.00
6m Forward	146.35	146.70

Table 2: Option Market rates for European option with 3 months expiry:

	Strike Price (X) ¥/$	Premium (%) for Call & Put Options
Call & Put	145.20	1.6766% (Call) & 1.7414% (Put)
Call & Put	146.00	1.3505% (Call) & 2.1006% (Put)

The expected spot price at expiry is ¥/$: 144.90/145.05

Suggest the best strategy for CFO of the Japanese Company to protect against uncertainty, with respect to the following alternatives:

a. Forward Hedge
b. Buy 3 months call, X-145.20
c. Sell 3 months put, X = 145.20
d. Buy call & sell put both having X = 146.00

Solution:

a) Forward Hedge

Amount payable after 3 months	$ 1,000,000
3-month applicable buying rate	¥ 145/$
Amount payable in Yen	¥ 145 m

b) Buy 3-month call option X = ¥ 145.20

If expected spot price after 3 month is ¥ 145.05, then company would not exercise its option.

Accordingly, the cost of import will be

Buying Yen in spot Market after 3 months	¥ 145.05 m
Add: Premium Paid ($ 1 m x 1.6766% x ¥ 145.20)	¥ 2.43 m
	¥ 147.48 m

c) Selling 3 month Put at X = ¥ 145.20

If expected spot price after 3 month ¥ 144.90, then Put Option buyer will exercise his /her option.

Accordingly, the import Bill will be:

Buying US$ under put option	¥ 145.20 m
Less: Premium Received ($ 1 m x 1.7414% x ¥ 145.20)	¥ 2.53 m
	¥ 142.67 m

d) Buying Call and selling Put at X = ¥ 146

Net Premium receipt

If expected spot Rate expiry happens to be ¥ 144.90/145.05, then call option will be lapsed and Put option by buyer will be exercised.

Accordingly, the import bill will be:

	Buying US$ under Put Option	¥ 146.00 m
Add:	Premium paid on call option = ¥ 146.00 x 1.3505%	¥ 1.9717 m
Less:	Premium Receipt on Put option = ¥ 146.00 x 2.1006%	(¥ 3.0669 m)
		¥ 144.9048 m

Decision: Since expected outflow is least in case of selling Put option, the same strategy is recommended.

QUESTION 52:

N 23 | M 21 | N 18 | N 10 | N 08 | RTP

Suppose a dealer bank quotes for a generic swap "AIC 8%/8.20% vs. 6M LIBOR Flat". Notional principal amount of swap is ₹ 1 Million, and the same is for a period of three years, reset after every six months. In this context, answer the following questions:

a. Interpret the dealer bank quote.

b. If a firm is buying a swap, what is the nature of cash flows?

c. If a firm is selling a swap, what is the nature of cash flows?

d. Calculate semi-annual fixed payment for the buyer of swap at the end of every six months.

e. If the six-month period from the effective date of swap to the settlement date comprises of 181 days and that the corresponding LIBOR was 5% on the effective date of swap, then what will be the first floating rate payment for the buyer?

f. If the settlement is on "Net Basis", how much the buyer of swap has to pay or receive at the end of first six months?

[Assume 30/360 days basis]

Solution:

a) Interpretation of dealer bank quote:

- AIC in the dealer bank quote refers to 'All in cost' i.e. cost of swap all inclusive.
- First part of the quote i.e. '8%/8.20% refers to the fixed leg part and the second part of the quote i.e., '6m LIBOR Flat' refers to the floating leg part.
- The difference in the fixed rates i.e. 20 bps refers to the margin charged by the Bank on the fixed leg of transactions.
- The term 'flat' on the floating leg quote, indicates that the Bank does not charge any commission on the floating leg. Therefore, bank charges 20 bps for transacting swap as a whole.

b) A buyer of swap pays 'Fixed' cash flows and receives 'Floating'. As per the quote, the buyer would pay 8.2% (higher of 8%, 8.2%) to the Bank and would receive '6M LIBOR' against it.

c) A seller of swap pays 'floating' cash flows and receives 'fixed'. As per the quote, the seller would pay '6M LIBOR' to the bank and would receive 8% (lower of 8%, 8.2%) against it.

d) Semi-annual Payment every six-month for buyer of Swap:

$$= 10,00,000 \times 8.20\% \times \frac{180}{360}$$

$$= ₹ 41,000$$

e) Floating Rate Payment

$$= 10,00,000 \times 0.05 \times \frac{181}{360}$$

$$= ₹ 25,138$$

f) Net Settlement buyer will pay:

$$= 41,000 - 25,138 = ₹ 15,862$$

Nov 23 – MTP

QUESTION 53:

MTP N 23

VK Ltd. is an Indian company which is planning to set up a manufacturing plant through its subsidiary in the small country Farland, (where hitherto it was exporting) in view of growing demand for its product and competition from other MNCs. The currency of Farland is the Farroh (Fr.).

An initial investment of Fr. 80 million in plant and machinery would be required. In addition to that the initial investment in working capital of Fr. 6 million would be also required which shall be financed through a loan from a local bank of Farland, at interest rate of 10% p.a. The working capital shall also be subject to inflation. At the end of 5 years, the subsidiary would be taken over by the Govt. of Farland for a price of Fr. 2 million. The part of the proceeds would be used to pay off the bank loan.

It is expected that subsidiary shall produce Net Cash Flows from Operations of Fr. 30 million per year at current price level over the five-year period, before allowing for Farland inflation of 8% per year. Depreciation on Plant and Machinery shall be charged at 20% per year on straight line basis. As a result of setting up the subsidiary, VK Ltd. expects to lose after-tax export income from Farland of INR 8,00,000 per year in current price terms, before allowing for India inflation of 3%. Profits in Farland are taxed at a rate of 20% after allowing deduction for interest and depreciation. All after-tax cash profits are remitted to the India at the end of each year. Indian tax @ 30% is charged on profit earned, but due to tax treaty between Farland and the India the tax paid in Farland is allowed to be set off against any India Tax liability. Taxation is paid in the year in which the liability arises. VK Ltd. requires foreign investments to be discounted at 12%. The current exchange rate is Fr.2.5/INR and the Farroh is expected to depreciate against INR by 5% per year.

Advise should VK Ltd. undertake the investment in Farland or not.

Note: 1. Present Figures in thousands multiple.
2. Round off all calculations.
3. PVF @12%

Year	1	2	3	4	5
PVF	0.893	0.797	0.712	0.636	0.567

Solution:

Calculation of the project cash flows for VK Ltd.'s subsidiary in Farland (Fr.'000)

Year	-	1	2	3	4	5
Cash flows from operations		32,400	34,992	37,791	40,815	44,080

Depreciation		-16,000	-16,000	-16,000	-16,000	-16,000
Interest		-600	-600	-600	-600	-600
Profit before Tax		15,800	18,392	21,191	24,215	27,480
Farland Tax		-3,160	-3,678	-4,238	-4,843	-5,496
Profit after Tax		12,640	14,714	16,953	19,372	21,984
Add back Depreciation		16,000	16,000	16,000	16,000	16,000
		28,640	30,714	32,953	35,372	37,984
Initial Investment	-80,000					
Working Capital Investment	-6,000					
Change in WC		-480	-518	-560	-605	-653
Loan Capital						-6,000
Sale of Subsidiary						2,000
	-86,000	28,160	30,196	32,393	34,767	33,331

Expected Exchange Rates

Year	Rate
0	2.5
1	$2.50 \times 1.05 = 2.63$
2	$2.50 \times (1.05)^2 = 2.76$
3	$2.50 \times (1.05)^3 = 2.89$
4	$2.50 \times (1.05)^4 = 3.04$
5	$2.50 \times (1.05)^5 = 3.19$

Calculation of Tax paid in India

Year	1	2	3	4	5
PBT (Fr)	15,800	18,392	21,191	24,215	27,480
Tax @ 10%	1,580	1,839	2,119	2,422	2,748
Exchange rate	2.63	2.76	2.89	3.04	3.19
Tax in India (₹ '000)	601	666	733	797	861

Calculation Net Present Value (NPV) for VK Ltd.'s subsidiary at parent company level

Year	0	1	2	3	4	5
Project Cash Flows (Fr. '000)	-80,000	28,160	30,196	32,393	34,767	33,331
Exchange Rate (Fr./₹)	2.50	2.63	2.76	2.89	3.04	3.19
Cash Invested from India (₹ '000)	-32,000	--	--	--	--	--
Cash Received in India (₹ '000)	--	10,707	10,941	11,209	11,437	10,449
Tax in India (₹ '000)		601	666	733	797	861
	-32,000	10,106	10,275	10,476	10,640	9,588
Lost export after tax (₹ '000)		824	849	874	900	927

Parent Cash Flow	-32,000	9,282	9,426	9,602	9,740	8,661
PVF	1.000	0.893	0.797	0.712	0.636	0.567
	-32,000	8,289	7,513	6,837	6,195	4,911
NPV						1,745

Decision: Since NPV of the project is positive it should be accepted.

QUESTION 54:

MTP N 23

Following information is related to the Convertible Bond of A Ltd. which is currently priced at ₹ 1060 per Bond:

(1) Conversion Parity Price - ₹ 53

(2) Conversion Premium – 10.41667%

(3) Percentage of Downside Risk with respect to Straight Value of Bond – 12.766%

Calculate:

a. No. of shares on Conversion.

b. Current Market Price Per Share of A Ltd.

c. Straight Value of Bond

Solution:

a. The No. of share on Conversion

$$\text{Conversion Parity Price} = \frac{\text{Bond Price}}{\text{No. of shares on Conversion}}$$

$$₹\ 53 = \frac{1060}{\text{No. of shares on Conversion}}$$

No. of shares on Conversion = 20

b. Market Price Per Share of A Ltd.

$$\text{Conversion Premium} = \frac{\text{Conversion Price of Share - CMP of share}}{\text{CMP of share}}$$

$$0.1041667 = \frac{53 - \text{CMP}}{\text{CMP}}$$

CMP = ₹ 48 per share

c. Straight Value of Bond

$$\text{Percentage of Downside Risk} = \frac{\text{Market Price of Bond - Straight Value of Bond}}{\text{Straight Value of Bond}}$$

$$0.12766 = \frac{1060 - \text{Straight Value of Bond}}{\text{Straight Value of Bond}}$$

Straight Value of Bond = ₹ 940 per Bond

QUESTION 55:

MTP N 23 | M 12 | RTP

Indira has a fund of ₹ 3 lacs which she wants to invest in share market with rebalancing target after every 10 days to start with for a period of one month from now. She has 3 close friends who have advised following different strategies:

a. Buy and Hold strategy

b. Constant Ratio

c. CPPI

Suppose she immediately starts with investment in Bonds (non-fluctuating) and Equity and decides to rebalance her portfolio after each 10 days and to invest in Nifty as equity component changes in tandem with that of Nifty. Further, Bond has no Beta.

As on date (i.e. beginning of month) Nifty is 5326 and minimum Nifty within a month can be most be 4793.40. If she chooses CPPI she will use "2" as the multiplier. If she chooses Constant Ratio plan she will maintain the ratio of 60:40 in Equity and Bonds respectively. Further, portfolio will be rebalanced each time Nifty is changed by 5% as compared to the previous Nifty.

You are required to evaluate Portfolio Position of Indira under each of the Strategies suggested by her friends and highlight the course of action to be taken if in the coming month after a gap of 10 days Nifty happened:

(1) 10 days later-being the 1st day of rebalancing if NIFTY falls to 5122.96.

(2) 10 days further from the above date if the NIFTY touches 5539.04.

Solution:

a. Under buy & hold strategy

Max fall in NIFTY $= \frac{5,326 - 4,793.4}{5,326} = 10\%$

Floor value = 3,00,000 - 10% = 2,70,000

Under this strategy investor invests an amount equal to floor value in Bonds i.e., 2,70,000 and the remaining ₹ 30,000 in equity.

Value of investment after 20 days:

Equity	$30,000 \times \frac{5539.04}{5326}$	31,200
Bonds		2,70,000
Total		3,01,200

b. Under CPPI

Immediately to start with:

Value of equity = (Portfolio Value – Floor Value) × multiplier

= (3,00,000 – 270,000) × 2 = 60,000

Value of debt = Total value of portfolio – value of equity

= 3,00,000 – 60,000 = 2,40,000

After 10 days:

Change in Nifty $= \frac{5122.96 - 5326}{5326} = 3.81\%$

Since change in nifty is less than 5%, portfolio will not be rebalanced.

After further 10 days:

Change in Nifty $= \frac{5539.04 - 5122.96}{5122.96} = 8.12\%$

Since change in nifty is more than 5%, portfolio will be rebalanced.

Value of portfolio on this date before rebalancing:

Equity = $60,000 \times \frac{5539.04}{5236}$ = 62,400

Value of debt = 2,40,000

Total Value of portfolio = 3,02,400

Ideal values as per policy

Equity = (3,02,400 – 2,70,000) × 2 = 64,800

Debt = 3,02,400 – 64,800 = 2,37,600

Indira should sell the risk-free security of Rs. 4,800 and invest the amount in equity.

c. Constant Ratio Plan

The ratio to be maintained is given as 60:40. Thus, Indira will invest ₹ 1,80,000 in equity and ₹ 120,000 in bonds.

After 10 days:

Change in Nifty = $\frac{5122.96 - 5326}{5326}$ = 3.81%

Since change in nifty is less than 5%, portfolio will not be rebalanced.

After further 10 days:

Change in Nifty = $\frac{5539.04 - 5122.96}{5122.96}$ = 8.12%

Since change in nifty is more than 5%, portfolio will be rebalanced.

Value of portfolio on this date before rebalancing:

Equity = $1,80,000 \times \frac{5539.04}{5326}$ = 1,87,200

Value of debt = 1,20,000

Total Value of portfolio = 3,07,200

Ideal values as per policy

Equity = 3,07,200 × 60% = 1,84,320

Debt = 3,02,400 – 1,84,320 = 1,22,880

Indira should sell the equity of Rs. 2,880 and invest the amount in bonds.

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No new question!