FINAL EXAMINATION

GROUP III

(SYLLABUS 2012)

SUGGESTED ANSWERS TO QUESTIONS
DECEMBER 2016

Paper- 14: ADVANCED FINANCIAL MANAGEMENT

Time Allowed: 3 Hours   Full Marks: 100

The figures on the right margin indicate full marks.

All workings must form part of your answer.

Wherever necessary, suitable assumptions may be made and

clearly stated in the answer.

No present value table or other statistical table will be provided in addition to this question paper.

Candidates may use relevant values from the information given at the end of the Question paper for computation of answers.

This paper contains two section, A and B. Section A is compulsory and contains question 1 for 20 marks. Section B contains questions 2 to 8, each carrying 16 marks.

Answer any five question from Section B.

Section A

1. (a) Answer all sub-divisions. Each carries 2 marks: 2×7 = 14

    (i) The following particulars relate to a mutual fund scheme:

Sector	Investment in shares (at cost) ₹ Crores	Index on Purchase date	Index on Valuation date
IT and ITES	28	1,750	2,950
Infrastructure	15	1,375	2,475

    The outstanding number of units is 1.25 crores.
    Calculate the Net Asset value (NAV) per unit.

    (ii) The capital of R Ltd. as on 31-03-2016 is as follows:
    9% Preference Shares of ₹10 each   8,00,000
    Equity shares of ₹10 each   14,00,000
    Profit after tax during the year = ₹3,60,000
    Equity Dividend paid = 20%
    Market Price of equity shares = ₹40 per share
    Calculate the Earnings per share (EPS) and the Price Earnings ratio

(iii) A convertible bond with face value of ₹10,000 is issued at ₹13,500 with coupon rate of 10.5%. The conversion rate is 15 shares per bond. The current market price of bond and share are ₹14,750 and ₹800 respectively. Compute the premium over conversion value.

(iv) State 4 features of Government Securities.

(v) What are the guidelines governing privately managed provident funds regarding the minimum per cent of investment?

(vi) An investor has two portfolios known to be on minimum variance set for a population of three securities A, B and C having weights mentioned below:

	WA	WB	WC
Portfolio X	0.3	0.4	0.3
Portfolio Y	0.2	0.5	0.3

What would be the weight for each stock for a portfolio constructed by investing ₹ 5,000 in portfolio X and ₹ 3,000 in portfolio Y?

(vii) What is an entry load and an exit load in the context of a Mutual Fund?

(b) State whether each of the following statements is True' or 'False'. Each question carries one mark. (You may write the Roman numeral and whether True or False without copying the situations into your answer books.) **1 × 6=6**

(i) The delta of a stock option is the number of units of stock one should hold per 100 options sold to create a risk-free hedge.

(ii) Forward contracts have more potential for default risks than futures.

(iii) Bridge Finance refers to loans taken by a company from its promoters until loans are disbursed by Financial Institutions.

(iv) Operating lease can be cancelled by the lessee before the expiry date.

(v) No prior approval of RBI is required for issue of Commercial Paper.

(vi) In India, the credit rating symbol for moderate safety is BB.

Answer:

(a) (i) Market value of shares = 28 × 2,950/1,750 + 15 × 2,475/1,375

= 47.2 +27 = 74.2

NAV = 74.2/1.25 = ₹59.36

(ii) EPS = $\dfrac{PAT - Preference\,Dividend}{No.\,of\,equity\,shares}$ = $\dfrac{3,60,000 - 72,000}{1,40,000}$ = ₹2.06 per share

PE ratio = Price/Earning = 40/2.06 = 19.42

(iii) Conversion Value = 15 × 800 = 12,000

Premium over conversion value = 14,750 – 12,000 = 2,750

2,750/12,000 = 22.92%

(iv) The students may write any fours features from following:

1) Government Securities are mostly interest bearing dated securities issued by RBI on behalf of the Government of India.

2) These securities are generally fixed maturity and fixed coupon securities carrying semi-annual coupon.

3) Issued at face value.

4) No default risk as the securities carry sovereign guarantee.

5) Ample liquidity as the investor can sell the security in the secondary market.

6) Interest payment on a half yearly basis on face value.

7) No tax deducted at source.

8) Can be held in demat form.

9) Rate of interest and tenor of the security is fixed at the time of issuance and is not subject to change (unless intrinsic to the security like FRBs - Floating Rate Bonds).

10) Redeemed at face value on maturity.

11) Maturity ranges from 91 days-30 years.

12) Government Securities qualify as SLR (Statutory Liquidity Ratio) investments, unless otherwise stated.

(v) Provident Fund – Minimum Investment requirement:

Security	Minimum %to be invested
Central Govt. Securities	25
Govt. Securities or State Govt. securities or guaranteed by them	15
Public Sector units and Financial Institution Bonds	30
Any of the above three categories	30

(vi)

Security	Portfolio X	Portfolio Y	Total	Weight
A	0.3 × 5,000 = 1,500	0.2 × 3,000=600	2,100	2,100/8,000 = 0.26
B	0.4 × 5,000 = 2,000	0.5 × 3,000 = 1,500	3,500	3,500/8,000 = 0.44
C	0.3 × 5,000 = 1,500	0.3 × 3,000 = 900	2,400	2,400/8,000 =0.30
			8,000	

(vii) Mutual Funds recover their initial marketing expenses from the fund subscribers either at the time of joining, by allotting lesser units (entry load) or by deducting from the existing NAV while making payment when unit holders exit the Fund (exit load).

(b) (i) False
(ii) True
(iii) False
(iv) True
(v) True
(vi) False

Section B

2. (a) **A petrochemical plant needs to process 32000 barrels in three months' time. The spot price per barrel is ₹ 8,775. A futures contract expiring three months from now is selling for ₹9,800 per barrel.**
    Assume that the size of one futures contract is 100 barrels.
    The plant wants to hedge through futures.
    Answer the following questions:
    (i) What would its position be in the futures market?
    (ii) How should the plant hedge itself against a price change after three months?
    (iii) How many futures should be transacted and in what manner?
    (iv) Explain and arrive at the effective price per barrel under the hedging strategy that would be paid by the plant if after 3 months, the price per barrel
    - **declines to ₹ 7,900**
    - **increases to ₹ 10,600**   **8**

   (b) **A Mutual Fund Company has introduced a scheme called Dividend Reinvestment Plan. The face value of a unit is ₹10. On 01-04-2011, Mr. K invested ₹ 2,00,000 in this plan when the Net Asset Value (NAV) was ₹ 38.20 per unit. The plan matured on 01/10/2016. The following are the particulars of the dividend declared over the period:**

Date	Dividend (%)	NAV (₹)
30/09/2011	10	39.10
30/09/2013	15	44.20
30/09/2014	13	45.05
30/09/2015	16	44.80
01/10/2016		40.40

   Ignore Security transaction tax.
   What is the effective yield per annum on the above plan?   **8**

Answer:

(a) (i) Its position will be long in the futures market.

   (ii) The plant needs to hedge itself against a rising price. Hence it should go long in the futures market. It should buy futures at ₹ 9800 per barrel and sell after 3 months.

   (iii) It should buy 320 futures.

   (iv) Effective Price per barrel under the hedging strategy will be ₹9,800 per barrel,   whichever way the market price may fluctuate later:

Price per barrel after 3m	₹7,900	₹10,600
Buy futures at	₹9,800	₹9,800
Sell futures later	₹7,900	₹10,600
Profit/(Loss on futures)	(-)₹1,900	₹800
Market price + profit/loss	₹(7,900+1,900)= ₹9,800	₹(10,600-800)= ₹9,800
Effective price per barrel by hedging	₹9,800	₹9800

(b) Units acquired = 2,00,000/38.2 = 5,235.60

Date	Units held	Value @ ₹10	Dividend (%)	Dividend Amt	Reinvestment Rate	New Units	Cumulative Units
01/04/11							5235.6
30/9/11	5235.6	52,356	10	5235.6	39.10	133.9	5369.5
30/9/13	5369.5	53,695	15	8054.25	44.20	182.22	5551.72
30/9/14	5551.72	55,517	13	7217.24	45.05	160.20	5711.92
30/9/15	5711.92	57,119	16	9139.04	44.80	204.00	5915.92

01/10/2015 Maturity Value	= 5,915.92 × 40.4	= 2,39,003.17
Less: Cost		= 2,00,000
Total Gain		= 39,003.17
Effective yield		= 39,003.17/2,00,000 over 5 years

$$= \frac{39003.17}{200000} \times \frac{1}{5}$$

$$= 3.9\%$$

Alternatively if the effective yield is calculated considering tenure of investment of $5\frac{1}{2}$ years instead of 5years, yield will be **3.55**%.

3. **(a) The following data relate to JB Ltd's share price:**

   Current Price: ₹ 3,000 per share

   6 months' future price = ₹ 3,500 per share

   It is possible to borrow money in the market for transactions in securities at 12% p.a. Consider continuous compounding of interest.

   Assume that no dividend was paid in the intervening period.

   You are required to calculate the theoretical minimum price of a 6 months' forward purchase and explain the possible arbitrage opportunity. **8**

   (b) Expected returns on two stocks for certain market returns are given below:

Market Return	A	D
7%	9%	4%
25%	40%	18%

   Calculate the following:

   (i) Beta of the two stocks

   (ii) Expected return of each stock if the market return is equally likely to be 7% or 25%.

   (iii) The Security Market Line(SML), if the market return is equally likely to be 7% or 25%.

   (iv) The alpha of the two stocks. **8**

Answer:

(a) Theoretical Forward Price

   Spot Price   = ₹3000

Required Rate of return = 12%

Time period = 6m = 0.5 yr

Theoretical forward price = Spot price × e^rate × period = 3000 e $^{0.12 \times 0.5}$ = 3000 e$^{0.06}$

= ₹(3000 × 1.0618) =₹3185.40

6 months future contract rate is ₹3,500.

Actual future price is higher and hence it is overvalued.

Action: Buy spot, sell future for arbitrage advantage.

Borrow ₹ 3,000 for a period of 6 months at 12% and buy the stock now at ₹3,000

Amount payable interest plus principal after 6m = ₹3185.4 (on continuous compounding)

Sell in the Futures market at forward price at ₹3,500.

Gain in futures market = ₹500

Net gain = ₹(500 -185.4) =₹ 314.6

(b) Risk free rate not given in question. It is assumed to be 7.5% in suggested answer. The students may assume any other value for risk free rate. Also alternative solution is provided which may also be adopted by students

(i) β of the stocks:

    A: (40 – 9)/ (25 – 7) = 1.72

    D: (18 – 4) / (25 – 7) = 0.78

(ii) Expected Returns:

    A: 0.5 × 9 + 0.5 × 40 = 24.5%

    D: 0.5 × 4 + 0.5 × 18 = 11%

(iii) Expected return of market portfolio = 0.5 × 7 + 0.5 × 25 = 16%

    Market risk premium = 16 – 7.5 = 8.5%; SML = 7.5% + β 8.5%

(iv) Expected Return =α+β Rm; Where α = Alpha; β = Beta; Rm = Market return

    For A: 24.5% = α a + 1.72 × 16%

               (-)α a=(-24.5)+27.52

               Or α a=(-)3.02

    For D: 11%= α d+0.78x16%

               (-)α d=(-)11+12.48

               α d =(-)1.48

Alternate answer

	Market Return X	Stock A Y	Stock D Z	XY	XZ	X^2
	7	9	4	63	28	49
	25	40	18	1000	450	625
Total	32	49	22	1063	478	674

$\bar{x}$= 32/2 = 16	$\bar{y}$ = 49/2 = 24.5	$\bar{z}$ = 22/2 = 11	$\sum \dfrac{xy}{n}$ = $\dfrac{1063}{2}$ = 531.50	$\sum \dfrac{xz}{n}$ = $\dfrac{478}{2}$ = 239	$\sum \dfrac{x2}{n}$ = $\dfrac{674}{2}$ = 337

$$\beta A = \frac{531.5-392}{337-256} = \frac{139.5}{81} = 1.722 \text{ Or } 1.72$$

$$\beta D = \frac{239-176}{81} = \frac{63}{81} = 0.777 \text{ or } 0.78$$

Under CAPM, Return (Stock A) = Risk free rate + B (Rm-Rf)

9 = Rf + 1.72(7-Rf) 9 = Rf(1-1.72) + 7 x 1.72 Rf = 3.04/0.72 = 4.2	or	40 = Rf (-0.72) + 25 x 1.72 Rf = 3/0.72 = 4.16 = 4.2

SML when market I equally likely to have returns 7 and 25 % = Expected Rm = (25+7)/2 = 16

Rm-Rf = 16-4.2 = 11.8

Slope of SML = 11.8

SML = 4.2 + 11.8 β

Stock D

Under CAPM, Return (Stock D) = Risk free rate + B (Rm-Rf)

4 = Rf + 0.78(7-Rf) 4 = Rf(1-0.78) + 5.46 Rf = -1.46/0.22 = -(6.64)	or	18 = Rf (0.22) + 19.5 Rf = -1.5/0.22 = -6.82

Rm-Rf = Slope = 16- (-6.64) = 22.64

SML: -6.64 + 22.64 β   or SML = -6.82 + 22.82 β

4. (a) G Ltd., an Indian Company has a payable of US $1,20,000 due in 3 months. The company wishes to cover the risk through the best of the following alternatives:
(i) Forward Contract   (ii) Money market and   (iii) Options.

The following information is available with the company:

Exchange Rate: Spot: ₹/ $ 68.25 / 68.32

3-months Forward: ₹/$ 68.85 / 69

Interest Rates (%) p.a. with annual rests:

     US   6.5 / 7 (Deposit/Borrow)
     India   15/16 (Deposit/Borrow)

Call option on $ with strike price of ₹ 69 is available at a premium of ₹ 0.10/$.

Put option on $ with a strike price of ₹ 69 is available at a premium of ₹ 0.05/$.

The Accounts Department of the company forecasts the future spot rate after 3 months to be as follows:

Spot Rate after 3 months (₹/$)	Probability
68.40	0.10
69.00	0.60
69.60	0.30

You are required to advise G Ltd. the best alternative among the three with supporting calculations and relevant figures.   12

(b) XYZ Ltd. requires ₹20,00,000 in order to finance an expansion plan. The following information is provided:
(i) Target Debt Equity ratio is 3:2.
(ii) Earnings per share for the current year is ₹ 20. Dividend payout ratio is 60% and dividend is expected to grow at 5% p.a. Only the current year's retained earnings is to be reckoned for the expansion.
(iii) Current market price per equity share is ₹ 90. Flotation cost is ₹ 6 per share.
(iv) Present equity share capital is ₹ 2 lacs, divided into fully paid shares of ₹ 10 each.
(v) Corporate tax rate is 30%.

Find the cost of new equity, cost of retained earnings and the corresponding weights of these in % in the expansion plan that will be used in the calculation of weighted marginal cost of capital.   4

Answer:

(a) (i) Hedge under forward Contract:
After 3 months, outflow will be 1,20,000 × 69 = ₹82,80,000

(ii) Money market:
Borrow Indian Rupees today, convert it into Dollars, invest in US and settle the loan after 3 months:
Amount of US $ to be invested now to get 1,20,000 US $ after 3 m @ 6.5 % interest
1,20,000/(1+.065/4) = 1,20,000 / 1.01625 = 1,18,081.18 $ today.

i.e. 1,18,081.18 × ₹68.32 = ₹80,67,306.21.

After 3 m, this amount has to be repaid with interest at 16 % p.a. i.e. 8067306.21*16% / 4 = 3,22,692.25.

Outflow after 3 m = ₹ 3,22,692.25 +₹ 80,67,306.21 = ₹83,89,998.46

(iii) Options:

Since the company has a $ liability, it should go long on the call option on $ i.e. buy a dollar call option with strike price ₹ 69 at a premium of ₹ 0.10 /$.

Total Premium paid = 1,20000 × 0.10 = ₹12,000

Call option pay off will be:

Spot Rate after 3m ₹/$	Action on option Exercise or Lapse	Rupee outflow excluding premium	Rupee outflow including premium	Probability	Expected Rupee outflow after 3 m
68.4	Lapse	68.4 ×1,20,000 = 82,08,000	82,20,000	0.1	8,22,000
69	Neutral	69 × 1,20,000 = 82,80,000	82,92,000	0.6	49,75,200
69.6	Exercise	82,80,000	82,92,000	0.3	24,87,600
Expected rupee outflow after 3 m					82,84,800

Put option pay off will be: (Premium = 0.05 × 1,20,000 = 6,000)

Spot Rate after 3m ₹/$	Action on option Exercise or Lapse	Rupee outflow excluding premium	Rupee outflow including premium	Probability	Expected Rupee outflow after 3 m
68.4	Exercise	69 × 1,20,000 = 82,80,000	82,74,000	0.1	8,27,400
69	Neutral	69 ×1,20,000 82,80,000	82,74,000	0.6	49,64,400
69.6	Lapse	83,52,000	83,46,000	0.3	25,03,800
Expected rupee outflow after 3 m					82,95,600

Alternatively the answer can be given that the price of the rupee is declining with cent percent probability i.e all prices after 3 months are more than the current spot price. Hence put option should not be used.

Advise: Forward hedge is suggested since it has the least outflow after 3 months.

(b) Equity capital = 2/5 × 20 lacs = 8 lacs.

New equity = Total equity less retained earnings

Retained Earnings = (EPS-DPS) × no. of shares

= 20 × (1- 0.6) × 20,000 = ₹ 1,60,000

New Equity = 8,00,000 – 1,60,000 =6,40,000

Cost of new equity ke = D1/(P0 less floatation) + g

D1 = D0(1+ g) = 12 × 1.05 = 12.6

P0 = 90

Ke = 12.6 / 84 + 0.05

= 0 .15 + 0.05 = 20%

Cost of retained earnings = 12.6/90 +0.05 = 19%

Weights in % = 6,40,000/20,00,000 = 32 % new equity

1,60,000/20 lacs = 8% retained earnings.

5. (a) An eatery is located in its own premises at Street A in a city. The Management is planning a relocation to a nearby new location, College Road, also owned by it so that it can attract new clients. Two years ago, the College Road location was considered and ₹ 2,00,000 was paid to a consultant for site study. Due to metro rail construction, the idea had to be abandoned. Now the road is fit for easy access. Until now, the College Road premises could not be let out and was idle. But now, it can be let out on an annual year end lease rental of ₹ 1,20,000. On similar terms, Street A premises would fetch ₹ 2,50,000. The eatery would have to spend ₹ 10,00,000 on initial refurbishment if it relocates. This will entail a bank loan at 12% interest. 25% of its new sales would be from the old customers at the Street A premises who represented 25% of the Street A sales value. Other information is given below:

Figures (₹/annum) (valid for the next 5 years)	Street A (same as per existing values)	College Road
Sales	15,00,000	21,00,000
Variable Cost	10,00,000	11,00,000
Contribution	5,00,000	10,00,000
Fixed Cost (excluding depreciation)	1,50,000	2,40,000
Depreciation	30,000	

(i) Depreciation is on straight line basis over 5 years. Assume that the life of the project is 5 years from now in both the premises.
(ii) Income Tax rate applicable is 35% and taxes are payable at the end of the year.
(iii) Cash flows from operations arise at the end of the year.
(iv) There is no salvage value in both the cases at the end of the project life.
(v) Both the sites are meant for long term usage. There is no sale of the premises envisaged.
(vi) Weighted average cost of capital until this project begins is 10%.
(vii) The Bank loan has to be repaid in equal installments of principal at the end of each year together with the applicable interest on the outstanding principal.
(viii) Assume no time lag between the capital expenditure and the commencement of operation.
(ix) Use P.V. factors as given in the table.
(x) Show calculations to the nearest rupee.
(xi) The cost - revenue structure is different in both the locations and the above table is applicable for all customers in a location.
(xii) No significant changes in the working capital requirement.

You are required to present a statement showing the evaluation on an incremental basis, of relocating to the new premises, showing the rationale behind the cash flows you consider and those that you do not, for the evaluation. Recommend from a financial perspective using the NPV method, whether the eatery should relocate to the college road premises. **12**

(b) Name the Regulatory Authority of the following entities:

(i)	Chit Funds
(ii)	Insurance Companies
(iii)	Housing Finance Companies
(iv)	Venture Capital Funds
(v)	Non-Banking Financial Companies
(vi)	Stock Broking Companies
(vii)	Nidhi Companies
(viii)	Private Banks

(You may mention the Roman numeral and the corresponding Regulatory Authorities without copying the entities in the answer books). **4**

Answer:

(a) ₹

	College Road			Street A		
	25%	75%	Total (Amount in Rupees)	25%	75%	Total (Amount in Rupees)
Sales Value	5,25,000	15,75,000	21,00,000	3,75,000	11,25,000	15,00,000
Variable cost	2,75,000	8,25,000	11,00,000	2,50,000	7,50,000	10,00,000
Contribution	2,50,000	7,50,000	10,00,000	1,25,000	3,75,000	5,00,000
Fixed Cost (excluding depreciation)	-	2,40,000	2,40,000	-	1,50,000	1,50,000
Profit (before depreciation)	2,50,000	5,10,000	7,60,000	1,25,000	2,25,000	3,50,000
Depreciation			2,00,000			30,000
Profit			5,60,000			3,20,000

Statement showing relevant cash flows for NPV method

Items of Cash Flow	Amount (in Rupees)	Working Note
Cash profits from operations (year end 1 to 5)	+2,66,500	(From existing customers + 1,25,000; from new customers + 2,85,000) Alternatively, difference in the total profit columns since cost revenue structures are different. Hence 4,10,000 before tax, i.e., 2,66,500 after 35% tax
Lease Rental of Street A premises	+84,500	Opportunity cost of Street A premises = 2,50,000 less amount that would have been gained by rent of College Road 1,20,000 = Opportunity loss, i.e., 1,30,000 is the opportunity gain, less 35% taxes
Tax shield on Depreciation	+59,500	Depn (new) = 2,00,000 less : Old = 30,000; Net = 1,70,000; Tax Shield 35% = 35% × 1,70,000
Total inflows from the project	+4,10,500	
P.V. factor at 12% × .65 = 7.8% years 1 to 5	4.014	12% is the project's cost of capital. Average thus far should not be taken, since this project involves this cost. Cost after tax = 65% of 12%. This is the minimum return that the project should fetch for acceptance.
Present value of inflows	+16,47,747	
Initial Outlay = Present value of outflows	−10,00,000	Occurs at end of year zero or beginning of year 1. Hence discount rate = 1
Net Present Value	+6,47,747	
Decision: It is recommended to relocate to the new premises.		
Cash flows not considered in the evaluation :		

Consultant's fee	2,00,000	Sunk cost. It has been incurred irrespective of the project and hence not considered.
Bank Interest		Not considered since it does not arise from the project. It is a financing decision. The specific cost of financing is considered in the cut off rate used for the NPV.
Bank Loan – Repayment	2,00,000	Not a project outflow.

(b)

Sl. No	Regulatory Authority	Entity
(i)	Respective State Govts.	Chit Fund
(ii)	IRDA	Insurance Companies
(iii)	NHB (National Housing Bank)	Housing Finance Companies
(iv)	SEBI	Venture Capital Funds
(v)	RBI	NBFC
(vi)	SEBI	Stock Broking Companies
(vii)	Ministry of Corporate Affairs (MCA), Govt. of India	Nidhi Companies
(viii)	RBI	Private Banks

6. **(a)** DF, a leasing company has agreed to lease an equipment to its customer for 4 years, which is also the life of the equipment. The equipment costs ₹ 300 lacs, has no salvage value and can be depreciated in 4 years on straight line basis. The customer has requested that lease rentals be paid at the beginning of the first and second years and at the end of the third and fourth years in the ratio 2:2:1:1 so that it can match its own cash availability. DF's tax rate is 35%. Its target rate of return is 12% p.a. for this lease.
    Calculate the lease rentals payable by the customer for each year.
    Use the present value factors up to 3 decimal places only, as given in the table. Round off the cash flows to the nearest rupee. Present your calculations showing the P.V. of the cumulative depreciation shield, P.V. factors applied to cash inflows each year and arrive at the lease rentals. **10**

   (b) Identify the type of risk in each of the following independent situations:

   (i) An owner of a house property wants to sell it, but he is not able to find buyers.
   (ii) An ATM of a bank has supplied an extra ₹ 100 note for every transaction on a certain day until it was reported and rectified.
   (iii) The risk of recession anticipated by the automobile industry.
   (iv) High component of debt used in the capital structure of a company to take

advantage of the high tax rates.

(v) The risk of loss in value of investment that cannot be eliminated by an investor through diversification.

(vi) Risk of a bank which has given a car loan to a person who has now defaulted two installments of EMIs.

(You may present the Roman numeral and the risk without copying the situations into your answer books). **6**

Answer:

(a) Let normal annual lease rent per annum is x.

(Rupees in lacs)

P.V. of cash inflows must equal the P.V. of cash outflows at 12%				
	End of year	Cash Flow	P.V. Factor	Discounted Cash Flows
Asset Cost	0	−300	1	−300
Depreciation Shield	1 – 4	75 × .35 = 26.25	.893+.797 +.712+.636=3.038	79.7475
Lease Rent	0	2x	1	2x
Lease Rent Tax outflow for Rent 1	1 1	2x 2x ×.35=.7x	.893 .893	1.786x -0.6251x
Tax outflow for Rent 2	2	2x ×.35=.7x	.797	-0.5579x
Lease Rent	3	1x × .65	.712	0.4628x
Lease Rent	4	1x × .65	.636	0.4134x
Total inflows of lease rent				3.4792x

3.4792x = 300 – 79.7475

3.4792x = 220.2525

x = 63.30550 lacs

Lease rent for first and second years = ₹126,61,100

Lease rent for third and fourth years = ₹63,30,550

Note: If the Tax outflow for rent for year 1 and 2 is considered in the year of rent received i.e in year 0 and 1,the lease rent for year 1 and 2 will be ₹132,00,234 and for year 3 and 4 will be ₹66,00,117.

(b) (i) Liquidity Risk

(ii) Operational Risk

(iii) Market Risk

(iv) Capital Structure Risk or Financial Risk

(v) Systematic Risk

(vi) Credit Risk

7. (a) A portfolio has the following constituents:

Securities	Cost (₹)	Dividend /Interest (₹)	Market Values (₹)	β
Equity Shares:				
GD	10,000	1,725	9,800	0.6
SI	15,000	1,000	16,200	0.8
BZ	14,000	700	20,000	0.6
Bonds : GB	36,000	3,600	34,500	0.2

(i) **Find the risk free return (% up to two decimal places) given that the expected return on market portfolio under CAPM is 15.7% and considering simple average β for the market portfolio and average market return to be represented by the above portfolio.**

(ii) **Find the expected rate of return for each security in the given portfolio under CAPM, taking average return for market portfolio.**

(iii) **What is the underlying assumption in (i) above when we use simple average β ?**

(iv) **What are the other appropriate weights that could be used to determine the average portfolio β?**   **10**

(b) Identify the defects in the following statement: **3**
A purchased for ₹90,000 a 10% Deep Discount Bond with face value ₹1,00,000 and maturity period of one year.

(c) What is "Rolling Settlement" in the context of Clearing House Operations?   **3**

Answer:

(a) Capital gain   = Market Value – Cost
                    = 9,800 + 16,200 + 20,000 + 34,500 – (10,000 + 15000 + 14,000 + 36,000)
                    = 80,500 – 75,000 = 5,500

(i)   Average return = $\dfrac{\text{Dividend} + \text{gain}}{\text{Cost}}$ = $\dfrac{7{,}025 + 5{,}500}{75{,}000}$ = 16.7%

(ii) E (R_M) = R_f + β$(R_m - R_f)$

    Simple average β = $\dfrac{0.6 + 0.8 + 0.6 + 0.2}{4}$ = $\dfrac{2.2}{4}$ = 0.55

    Given E (R_M) = 15.7%

    Substituting the values above.

    E(R_M) = 15.7%   = R_f + 0.55 (16.7% - R_f)

           R_f (1 – 0.55)   = 15.7 – 9.185

$R_f \times 0.45 \qquad = 6.515$

$R_f = 14.48\%$

Expected Return for each security $= R_f + \beta (R_m - R_f)$

$\qquad\qquad\qquad\qquad = 14.48 + \beta (2.22)$

	β	2.22β	E(R)
GD	0.6	1.332	15.81%
SI	0.8	1.776	16.26%
BZ	0.6	1.332	15.81%
GB	0.2	0.444	14.92%

(iii) The underlying assumption is that the market portfolio consists of 1 security of each type given on equal number of each securities and

(iv) Other appropriate weights for portfolio β are the cost values and the market values, where values would mean number of securities × price per security.

(b) Defect:

10 % is wrong. DD Bonds are zero per cent bonds.

Maturity Period one year is wrong. Usually for long periods up to 30 years, at least five year period.

Hence Discount amount would not be a mere 10,000. It will be very high, i.e. issue price will be much lower than 90,000 so that interest for the tenure is covered in the form of the discount.

(c) Rolling Settlement:

Settlement is the process in which traders who have made purchases make payments while those who have sold shares deliver them. The Exchange ensures that buyers receive their shares and sellers receive their payment. The process of settlement is managed by stock exchanges through Clearing Houses.

A Rolling Settlement is the settlement cycle of the Stock Exchange where all trades outstanding at the end of the day have to be settled, i.e. the buyer has to make payments for securities purchased and the seller has to deliver the securities sold.

Example: In case of T + 1 settlement, transactions entered into on a day must be settled within the next working day. In the case of T + 2, settlement has to happen within two working days from the date of the transaction.

8. **(a) Mr. K purchased on DC Ltd.'s stock, one 3 month call option with a premium of ₹ 20 and a strike price of ₹ 550 and a 3 month put option with a premium of ₹ 10 and a strike price of ₹450.**
   DCs stock is currently selling at ₹ 500. Determine his profit or loss if:

   (i) DC Ltd.'s share price falls to ₹ 350 after three months
   (ii) DC Ltd.'s share price increases to 600 after three months.
   Assume option size to be 100 shares of DC Ltd. **5**

(b) The following information is available regarding four Mutual Funds:

Mutual Fund	Return %	Standard Deviation (σ)%	β(Beta)
A	12%	15	0.80
B	16%	22	0.76
C	21%	37	1.15
D	13%	24	1.32

Risk Free rate is 10% and face value is ₹100 each.

Evaluate the performance of these Mutual Funds using Sharpe ratio and Treynor's ratio.

Comment on the evaluation after ranking the funds. **5**

(c) State the features of the call money market on the following aspects:
(i) Purpose
(ii) Duration
(iii) Security
(iv) Call rate
(v) Lenders (Name four lenders) **6**

Answer:

(a)

Price ₹ 350	Action	Premium	Gain	Net Gain
Call	Lapse	-20 × 100 = -2000		
Put	Exercise	-10 × 100 = -1000	100 × 100 = 10000	7000
Price ₹ 600				
Call	Exercise	-20 ×100 = -2000	50 × 100 =5000	
Put	Lapse	-10 ×100 = -1000		2000

(b)

Fund	Return (%)	Return - Risk free rate 10 %	Std. Devn (%)	Sharpe Ratio (III/IV)	Ranking	β	Treynor Ratio (III/VII)	Ranking
I	II	III	IV	V	VI	VII	VIII	IX
A	12	2	15	0.133	3	0.8	2.5	3
B	16	6	22	0.27	2	0.76	7.89	2
C	21	11	37	0.30	1	1.15	9.57	1
D	13	3	24	0.125	4	1.32	2.27	4

Comment: Both the ranking are the same. This means that the funds are reasonably diversified.

(c) Call Money Market – Features:
(i) Purpose:
   Close to Money;
   Provide liquidity for Government and banks
   Low risk

Short term

Banks use this for CRR or SLR requirements

Bill market, stock Exchange Dealers and high net worth individuals

To meet sudden demand for funds arising out of large outflows.

(ii) Duration: One day to fifteen days.

(iii) Securities: Unsecured; No collateral security.

(iv) Call rate: Varies as per market demand and supply conditions. It is high during March (even around 25 %) and low in April, October, etc (even as low as 7 %). It also varies according to place - It is higher in Kolkata and lower in Mumbai.

(v) Lenders: RBI, Banks, Primary Dealers, Financial Institutions like LIC, UTI, GIC, IDBI, NABARD, ICICI, Specified All India Financial Institutions, Mutual Funds.

You may use relevant figures from the following information:

$e^{.015}$	**1.01511**
$e^{.06}$	**1.0618**
$e^{.12}$	**1.1275**
$e^{.36}$	**1.4326**
$e^{.0036}$	**1.00366**
$e^{.72}$	**2.0414**

Present value factors $(1/(1 + x))^n$

End of year (n) / Rate (x) %	1	2	3	4	5	6	7
6.5%	0.939	0.882	0.829	0.777	0.730	0.685	0.644
7.8%	0.928	0.861	0.798	0.740	0.687	0.637	0.591
10%	0.909	0.826	0.751	0.683	0.621	0.564	0.513
12%	0.893	0.797	0.712	0.636	0.567	0.507	0.452