FINAL EXAMINATION

GROUP III

(SYLLABUS 2012)

SUGGESTED ANSWERS TO QUESTIONS

JUNE 2016

Paper- 14: ADVANCED FINANCIAL MANAGEMENT

Time Allowed : 3 Hours **Full Marks : 100**

The figures in the margin on the right side 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 information given at the end of the question paper for computation of answers.

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

Section A

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

(i) A safety mutual fund that had a net asset value of ₹ 20 at the beginning of a month, made income and capital gain distribution of ₹0.06 and ₹ 0.04 respectively per unit during the month and then ended the month with a net asset value of ₹ 20.25. Calculate the monthly return.

(ii) Mr. Ravi is planning to purchase the shares of X Ltd. which had paid a dividend of ₹ 2 per share last year. Dividends are growing at a rate of 10%. What price would Mr. Ravi be willing to pay for X Ltd.'s shares if he expects a rate of return of 20%?

(iii) The spot price of securities of X Ltd. is ₹160. With no dividend and no carrying cost, compute the theoretical forward price of the securities for 1 month. You may assume a risk free interest rate of 9% p.a.

(iv) It is given that ₹ / £ quote is ₹94.30 – 95.20 and that ₹ / $ quote is 66.25 – 66.45. What would be the $/£ quote?

(v) When are call options and put options said to be 'in the money' in the futures market?

(vi) A firm has an equity beta of 1.40 and is currently financed by 25% debt and 75% equity.
What will be the company's equity beta if the company changes its financing policy to 33% debt and 67% equity? [Assume corporate tax at 35% and zero debt beta]

(vii) XYZ Ltd. has a uniform income that accrues in a 4-year business cycle. It has an average EPS of ₹ 20 (per share of ₹ 100) over its business cycle.
Find out the cost of equity capital, if market price is ₹ 175.

(b) State whether each of the following is True (T) or False (F). Each question carries 1 mark: 1×6=6

(i) Inter Bank Participation Certificate (IBPC) can be issued by any Scheduled Commercial Bank and its interest rates are freely determined in the market.

(ii) Arbitrageurs are interested in making purchases and sales in different markets at different times to profit from the price discrepancy between the markets.

(iii) At least 60% of the assets of an Infrastructure Debt Fund should be invested in debt securities or securitized debt instruments of infrastructure companies.

(iv) In a yield based auction, successful bidders are those who have bid at or below the cut off yield, whereas in a price based auction, successful bidders are those who have bid at or above the cut-off price.

(v) A straddle is a strategy that is accomplished by holding an equal number of puts and calls with the same strike price and expiration dates.

(vi) Treasury Bills are not eligible for Repo transactions.

Answer:

1. (a)

(i) Capital Appreciation = Closing NAV – Opening NAV = ₹20.25 – ₹20 = ₹0.25
Total return = Capital Appreciation + Income + Capital Gain = 0.25 + 0.06 + 0.04 = ₹0.35
Monthly Return = Total Return/Opening NAV = 0.35/20 = 0.0175 = 1.75%

(ii) $P_0 = D_1 / (K_e - g)$ $D_1 = D_0(1+g) = 2(1+0.10) = ₹2.20$
$P_0 = 2.20/(0.20 - 0.10) = ₹22.$

(iii) Theoretical forward price of security of X Ltd. $[F_x] = S_x \times e^{rt} = ₹160 \times e^{0.09 \times 0.0833}$
$= ₹160 \times e^{0.0075}$
$= ₹160 \times 1.007528$
$= ₹161.20$

(iv) The rate for $/£ is to be calculated.
The formula is –

$$\$/£ = \frac{Re / £_{bid}}{Re / \$_{ask}} : \frac{Re / £_{ask}}{Re / \$_{bid}} = \frac{94.30}{66.45} : \frac{95.20}{66.25} = 1.4190 : 1.4370$$

Or 1.42: 1.44

(v) In call options when strike price is below the price of underlying futures, call option is 'in the money'.
In put options, when the strike price is above the price of underlying futures put option 'is in the money'.

(vi) Debt Beta is 0, since it is not given.

Asset beta = Weighted Average Beta of Equity + Weighted Average Beta of Debt
= [β_E × Equity] / [Equity + Debt × (1 -tax)] + [β_D × Debt (1- tax)] / [Equity + Debt × (1 tax)]
= {(1.40 × 0.75)/ [0.75 + 0.25 × (1 - 0.35)] } + 0 = 1.1507.

Company's Beta = [β_E × Equity] / [Equity + Debt × (1 -tax)] + {[β_D × Debt (1- tax)] /[Equity + Debt x (1 -tax)]}

1.1507 = [β_E × 0.67] / [0.67 + 0.33 (1 - 0.35)] + 0 ; β_E = 1.52.

(vii) K_E = [Earnings per share / Market price per share] × 100 = [₹ 20 /₹175] × 100 = 11.43%.

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

Section B

Answer any five questions. Each question carries 16 marks.

2. (a) The following information is available regarding three Mutual Funds:

Mutual Fund	Average Return	Standard Deviation	Correlation with market
A	24%	8%	0.30
B	16%	4%	0.70
C	12%	3%	0.50

If the risk free return is 6%, return on market portfolio is 15% with a standard deviation of 4% ascertain:

(i) Total Gain and the Net Gain under Fama's Net Selectivity.

(ii) Systematic Risk and Unsystematic Risk. 4+4=8

(b) The equity shares of R Ltd. are being sold at ₹ 210. A 3-month call options is available for a premium of ₹ 6 per share and a 3 month put option is available for a premium of ₹ 5 per share.

Find out the net pay off of the option holder of the call option and put option given that:
(i) the strike price in both cases is ₹220, and
(ii) the share price on the exercise day is ₹ 200 or ₹ 210 or₹ 230 or ₹ 240. 8

Answer:

2. (a) **Working Note:**

Risk Free Return (R_f) = 6%

Market Return (R_m) = 15%

Market Standard Deviation (σ_m) = 4%

Market Risk Premium ($R_m - R_f$) = 15 % - 6% = 9%

Particulars	A	B	C
Average Return (R_p)	24%	16%	12%
Standard Deviation (σ_p) (Total Risk)	8%	4%	3%
Correlation with market (P_{pm})	0.30	0.70	0.50
Portfolio Beta (B_p) = $P_{pm} \times (\sigma_p \div \sigma_m)$	0.30 × 8 ÷4 = 0.60	0.70×4÷4 = 0.70	0.50 × 3 ÷4=0.375
Actual Risk Premium ($R_p - R_f$) (A)	24-6 = 18%	16-6 = 10%	12-6 = 6%
Computation of Net Gain			
Desired Risk Premium [$(R_m - R_f) \times \sigma_p \div \sigma_m$] (B)	[9% × 8% ÷ 4%] 18%	[9% × 4% ÷ 4%] 9%	[9% × 3% ÷ 4%] 6.75%
Fama's Net Selectivity (Net gain) = (A - B)	0	1%	(0.75%)
Computation of Total Gain			
Desired Risk Premium [$(R_m - R_f) \times P_{pm} \times \sigma_p \div \sigma_m$] OR [Risk Premium in (B) × P_{pm}] (C)	18% × 0.30 = 5.4%	9% × 0.7 = 6.3%	6.75% × 0.5 = 3.375%
Total Gain [A – C]	(18% -5.4%) = 12.6%	(10%-6.3%) = 3.7%	(6% -3.375%) = 2.625%
(ii) Systematic Risk ($\sigma_p \times B_p$)	8% × 0.6 = 4.8%	4% ×.70 = 2.8%	3% ×0.375 = 1.125%
Unsystematic Risk (Total Risk- Systematic Risk)	3.2%	1.2%	1.875%

2. (b) Net Pay off(Call Option) for option holder. ₹

Spot Price on Expiry Date(SP)	Exercise Price (EP)	Value of call [Maximum of (SP-EP),0]	Action	Option premium	Net pay-off[option holder]
(1)	(2)	(3)= Max[(1-2),0]	(4)	(5)	(6)= (3)-(5)
200	220	200-220 =(-20),0 →0	Lapse	6	(-6)
210	220	210-220 =(-10),0 →0	Lapse	6	(-6)
230	220	230-220 =10,0→0	Exercise	6	4
240	220	240-220=20,0→20	Exercise	6	14

Net pay off(put option) for option holder (₹)

Spot Price on Expiry Date(SP)	Exercise Price (EP)	Value of call [Maximum of (EP-SP),0]	Action	Option premium	Net pay-off[option holder]
(1)	(2)	(3)= Max [(2-1),0]	(4)	(5)	(6) =[(3)-(5)]
200	220	220-200 =20,0 →20	Exercise	5	15
210	220	220-210 =10,0 →10	Exercise	5	5
230	220	220-230 =(-10),0→0	Lapse	5	(-5)
240	220	220-240=(-20),0→0	Lapse	5	(-5)

3. (a) The stock of B Ltd. performs well relative to other stocks during recessionary periods. The stock of C Ltd., on the other hand, does well during growth periods. Both the stocks are currently selling for ₹ 100 per share. The rupee return (dividend plus price) of these stocks for the next year as follows:

Economic Condition	Probability	Return on B's Stock	Return on C's stock
High growth	**0.3**	**50**	**75**
Low growth	**0.4**	**55**	**65**
Stagnation	**0.2**	**60**	**45**
Recession	**0.1**	**70**	**30**

Calculate the expected return and standard deviation of investing in each of the following:

(i) ₹2,000 in the equity stock of B Ltd.

(ii) ₹2,000 in the equity stock of C Ltd. 5+5=10

(b) A company is considering a proposal of installing drying equipment. The equipment would involve a cash outlay of ₹6,00,000 and net working capital of ₹80,000. The expected life of the project is 5 years without any salvage value. Assume that the company is allowed to charge depreciation on straight line basis for income tax purpose. The estimated before-tax cash inflows (₹' 000) are given below:

Year-end	1	2	3	4	5
Before-tax cash inflows	**240**	**275**	**210**	**180**	**160**

The applicable income-tax rate of the company is 35%. If the company's cost of capital is 12%, calculate the equipment's discounted payback period, and net present value. 6

Answer:

3. (a) (i) 20 Equity Share of B Ltd. can be bought for ₹2000. The probability distribution and overall return will be as follows:

Economic Condition	Overall Return ₹	Probability	Expected Return (₹)
High Growth	20(50) = ₹ 1000	0.3	300
Low Growth	20(55) = ₹ 1100	0.4	440
Stagnation	20(60) = ₹ 1200	0.2	240
Recession	20(70) = ₹ 1400	0.1	140
Expected Return			₹ 1,120

The standard deviation of return is = $\sqrt{\sum(\text{Square of the deviation} \times \text{Probability})}$

$\sqrt{0.3(1000 - 1120)^2 + 0.4(1100 - 1120)^2 + 0.2(1200 - 1120)^2 + 0.10\,(1400 - 1120)^2}$

$= \sqrt{(4320 + 160 + 1280 + 7840)}$

$= \sqrt{13,600}$

= 116.61

(ii) 20 Equity share of C Ltd. can be brought for ₹2,000

The probability distribution and overall return will be as follows:

Economic Condition	Overall Return ₹	Probability	Expected Return (₹)
High Growth	20(75) = ₹1500	0.3	450
Low Growth	20(65) = ₹1300	0.4	520
Stagnation	20(45) = ₹ 900	0.2	180
Recession	20(30)= ₹ 600	0.1	60
Expected Return			1,210

The standard deviation of return is = $\sqrt{\sum(\text{Square of the deviation} \times \text{Probability})}$

$\sqrt{0.3(1500 - 1210)^2 + 0.4(1300 - 1210)^2 + 0.2(900 - 1210)^2 + 0.10\,(600 - 1210)^2}$

$= \sqrt{25230 + 3240 + 19220 + 37210}$

$= \sqrt{84900}$

= 291.37

3. (b) Statement showing the calculation of present value of CFAT: [₹000]

Particulars	Year 1	Year 2	Year 3	Year 4	Year 5
Cash flows before tax	240	275	210	180	160
Less: Tax@35%	(84)	(96.25)	(73.5)	(63)	(56)
After tax cash flows	156	178.75	136.5	117	104
Add: tax saving on depreciation	42	42	42	42	42
Net cash flow after tax	198	220.75	178.5	159	146
Release of working capital	-	-	-	-	80
CFAT for last year	-	-	-	-	226
PVF at 12%	0.8929	0.7972	0.7118	0.6355	0.5674
PV	176.79	175.98	127.06	101.04	128.23
Cumulative discounted cash flows	176.79	352.77	479.83	580.87	709.10
NPV = ₹709.10 – ₹680 = ₹29.10 thousand					

Discounted payback period = 4 Years +(₹6,80,000 – 5,80,870) / ₹1,28,230 = 4.773 years

4. (a) A portfolio Manager has the following four stocks in his portfolio:

Security	No. of shares	Market price (₹) per Share	β = Beta
VL	**12,000**	**40**	**0.9**
CL	**6,000**	**20**	**1.0**

SL	**10,000**	**25**	**1.5**
AL	**2,000**	**225**	**1.2**

Compute the following:

(i) Portfolio Beta (β)

(ii) If the Portfolio Manager seeks to reduce the Beta to 0.8, how much risk-free investment should he bring in? Verify the result. **10**

(b) State any six RBI Guidelines relating to Infrastructure Debt Fund Schemes (IDF Schemes).

6

Answer:

4. (a) (i)

Security	No. of shares	Market price Per share	Value Amount (₹)	% of total amount	Beta	Weighted Beta
VL	12,000	40	4,80,000	0.3692	0.9	0.3323
CL	6,000	20	1,20,000	0.0923	1.0	0.0923
SL	10,000	25	2,50,000	0.1923	1.5	0.2885
AL	2,000	225	4,50,000	0.3462	1.2	0.4154
			13,00,000	1.000		1.129

Hence Portfolio Beta (β) = 1.129

(ii) Required Beta = 0.8
It should become 0.8/1.129 = 70.86% of the present portfolio
If ₹13,00,000 is 70.86%

Total Portfolio should be $\frac{13,00,000 \times 100}{70.86\%}$ = ₹18,34,600

Additional investment in zero risk should be = ₹(18,34,600 – 13,00,000) = ₹5,34,600
Revised Portfolio will be

Security	No. of shares	Market price Per share	Value Amount (₹)	% of total amount	Beta	Weighted Beta
VL	12000	40	4,80,000	0.2616	0.9	0.2354
CL	6000	20	1,20,000	0.0654	1.0	0.0654
SL	10000	25	2,50,000	0.1363	1.5	0.2045
AL	2000	225	4,50,000	0.2453	1.2	0.2944
Risk Free Asset	53460	10	5,34,600	0.2914	0	0
			18,34,600	1.000		0.7997 Or 0.80

4. (b) RBI Guidelines relating to Infrastructure Debt Fund Schemes:

Any investments by banks and NBFCs in IDF Schemes will require a prior approval from the RBI. The RBI Guidelines prescribe various thresholds for investment in trust based IDFs by banks and NBFCs.

i) Banks acting as sponsors to IDFs-MF will be subject to existing prudential limits on investments in financial services companies and their capital market exposure.

ii) NBFCs will need to have at least $60 million as net-owned funds.

iii) NBFCs are also required to be in existence for five years to invest in IDFs-MF, meaning thereby that start-up NBFCs would not be able to invest in trust based IDFs.

iv) IDFs setting up as NBFC must have net-owned-funds of at least $60 million and issue rupee or dollar denominated bonds of minimum 5 year maturity to investors.

v) NBFCs should be assigned a minimum credit rating 'A' or equivalent of CRISIL, FITCH, etc.

vi) NBFCs are only allowed to invest in Public Private Partnership ('PPP') projects and post-commercial operation date ('COD') infrastructure projects. Such projects should have been in satisfactory commercial operation for at least one year before any investment is made in them.

vii) NBFCs should also be party to a tripartite agreement with the concessionaire and the project authority for ensuring a compulsory buyout with termination payment.

viii) Income of IDFs-NBFC will be exempted from income tax and withholding tax on interest payments on the borrowings has been reduced from 20% to 5%.

ix) Insurance and Pension Funds are one of the key investors as they have long term resources, but would require regulatory approval before investing in IDFs. As per the current norms of Insurance Infrastructure Financing Regulatory and Development Authority ('IRDA'), it is mandatory for insurance companies to direct 15% of their investment towards infrastructure.

5. (a) A firm has an investment proposal requiring an outlay of ₹1,92,000. The Investment proposal is expected to have two years economic life with no salvage value. In year-end 1, there is a 0.4 probability that cash inflow after tax will be ₹1,20,000 and 0.6 probability that cash inflow after tax will be ₹1,44,000. The probability assigned to cash in flows after tax for the 2nd year-end are as follows:

The cash inflow year –end 1	**₹1,20,000**		**₹1,44,000**	
The cash inflow year –end 2	**Probability**			**Probability**
	₹57,600	**0.2**	**96,000**	**0.4**
	₹76,800	**0.3**	**1,20,000**	**0.5**
	₹1,05,600	**0.5**	**1,44,000**	**0.10**

The firm uses 8% discount rate for this type of investment.

(i) Construct a decision tree for the proposed Investment project and calculate the expected Net Present Value.

(ii) What is the most likely NPV of the project and what is the corresponding probability?

(iii) What is the probability of the project having a negative NPV? 4+2+2=8

(b) Mr. G, on 01.07.2013, during the initial offer of some mutual fund invested in 20,000 units having face value of ₹ 20 per unit.

On 31.03.2014, the dividend operated by the Mutual Fund was 10% and Mr. G found that his annualised yield was 153.33%.

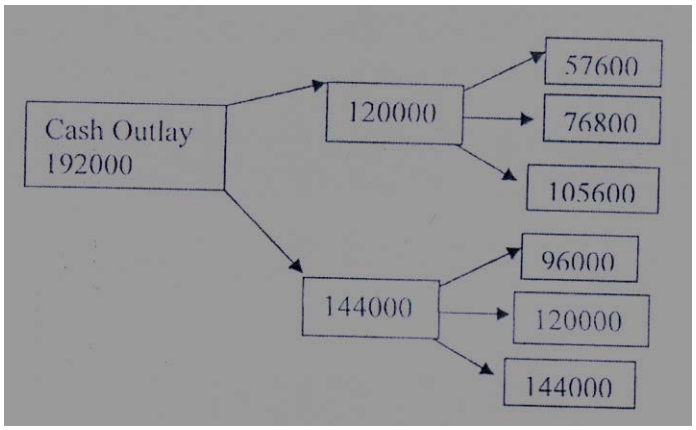
On 31.03.2015, 20% dividend was given.

On 31.03.2016, Mr. G redeemed all his balance of 22,600 units when his annualised yield was 73.52%.

What is the Net Asset Value (NAV) as on 31.03.2016? 8

Answer:

5. (a) (i) The decision tree diagram is presented in chart identifying various paths and outcomes and computation of various paths/outcomes and NPV are presented in the following table.



Path No.	Joint Probability
1	0.08
2	012
3	0.20
4	0.24
5	0.30
6	0.06
	1.00

The Net Present Value (NPV) of each path at 8% discount rate is given below:

Path	Year 1 Cash flow ₹	Year 2 Cash flows ₹	Total Cash in Flow (PV) ₹	Cash Outflow ₹	NPV ₹
1	120000 × 0.9259 = 1,11,108	57,600 ×0 .8573 = 49,380	1,60,488	1,92,000	-31,512
2	1,11,108	76,800 × 0.8573 = 65,841	1,76,949	1,92,000	-15,051
3	1,11,108	1,05,600 × 0 .8573 = 90,531	2,01,639	1,92,000	9,639
4	1,44,000 × 0.9259 = 1,33,330	96,000 × 0.8573 = 82,301	2,15,631	1,92,000	23,631
5	1,33,330	1,20,000 × 0 .8573 = 1,02,876	2,36,206	1,92,000	44,206
6	1,33,330	1,44,000 × 0.8573 = 1,23,451	2,56,781	1,92,000	64,781

Statement Showing Expected Net Present value

Path	NPV (₹)	Joint probability	Expected NPV ₹
1	-31,512	0.08	-2,521
2	-15,051	0.12	-1,806
3	9,639	0.20	1,928

4	23,631	0.24	5,671
5	44,206	0.30	13,262
6	64,781	0.06	3,887
			20,421

(ii) The most likely NPV of the project = ₹44,206; Probability = 0.3 or 30%

(iii) The Probability of negative NPV of the project = Path (1) and (2) = 0.08 + 0.12 = 0.20 or 20%

5. (b) Yield for 9 months = 153.33% × 9/12 =115%.

Market value of investments as on 31.03.2014 = ₹4,00,000 + (₹4,00,000 × 115%) = ₹8,60,000.

Therefore, NAV as on 31.03.2014 = (₹ 8, 60,000 – ₹40,000)/ 20,000 = ₹41.

[NAV would stand reduced to the extent of dividend payout, being ₹ 20,000 × ₹20 × 10% = ₹40,000.]

Since dividend was reinvested, additional units acquired = ₹ 40,000 /₹41 = 975.61 units.

Therefore, units as on 31.03.2014 = 20,000+ 975.61 = 20,975.61 units.

[Alternatively, units as on 31.03.2014 = ₹ 8,60,000 /₹41 = 20,975.61 units.]

Dividend as on 31.03.2015 = 20,975.61 × ₹20 × 0.2 = ₹ 83,902.44.

Let X be the NAV as on 31.03.2015, then no. of new units reinvested will be ₹83,902/ X Accordingly, 22,600 units shall consist of reinvested units and 20,976 units (as on 31.03.2014).

Thus by way of equation: 22,600 units = [₹ 83,902 / X] + 20,976 units.

Therefore, NAV as on 31.03.2015 = X = ₹ 83,902 / 1,624 units = ₹ 51.66.

NAV as on 31.03.2016 =[₹ 4,00,000 (1 + 0.7352 × {33 / 12})]/ 22,600 units = ₹53.48.

6. (a) A share is currently priced at ₹600. It is known that at the end of one month, it will be either ₹570 or ₹630. The risk-free interest rate is 8% per annum with continuous compounding. Find the value of a 1-month European call option with a strike price of ₹ 592, with the help of a Binomial Model. 8

(b) K Ltd. has the following capital structure as per its Balance Sheet as at 31st March, 2016.

	₹ In lakhs
Equity share capital (fully paid shares of ₹ 10 each)	**4**
18% Preference share capital (fully paid shares of ₹ 100 each)	**3**
Retained earnings	**1**
12.5% Debentures (fully paid of ₹ 100 each).	**8**
12% Term Loan	**4**
	20

Additional Information:

(i) The current market price of the company's equity share is ₹64.25. The dividend expected on the equity share at the end of year is at 80% which is expected to grow @ 5 % p.a. forever.

(ii) The preference shares of the company which are redeemable after 10 years are

currently selling at ₹ 90 per preference share.

(iii) The debentures of the company which are redeemable after 5 years are currently quoted at ₹ 95 per debenture.

(iv) The corporate tax rate is 30%.

Calculate the weighted average cost of capital using Market Value Weights. 8

Answer:

6. (a)

Computation of Option Delta [Binomial Model]:

	FP_1	FP_2
Future spot price	630	570
Position on expiry date [compared to Exercise Price]	In the money	Out of money
Action on Expiry Date	Exercise	Lapse
Value of Option on Expiry [Future spot price-Exercise price]	[630 – 592] = 38	0

Option Delta = Change in value of option /Change in Future spot price = [₹ 38-0] / [₹ 630 – ₹570]= 0.633

Computation of amount to be invested in Risk Free Rate:

= Present value of Lower band of Future spot price i. e, FP_2

= Present value of ₹570 discounted at 8 % continuous compounding for a 1- month period

= ₹ 570 × e^{-rt} = ₹570 × $e^{-0.08 \times 1/12}$ = ₹570/ $e^{0.007}$ = ₹570/ 1.00702 = ₹566.

Value of call = Option Delta × [Current stock price - Amount to be invested at Risk free rate]

= 0.633 × [₹ 600 – ₹566] = ₹ 21.522.

Note: The problem can be worked out by using any other method under Binomial Model since no specific method is mentioned in the question paper.

6. (b) Statement showing the weighted average cost of capital (using market value weight):

Source of capital A	Amount of each source of capital (In lakhs) B	Proportion of each source of capital C	After tax cost of each sources of capital D	Product E = C × D
Equity share capital	₹25.70	0.6425 (i. e., 25.7/40)	0.1745	0.1121
18% preference share capital	₹2.70	0.0675 (i.e., 2.7/40)	0.2000	0.0135
12.5% Debenture	₹7.60	0.1900 (i. e., 7.6/40)	0.1000	0.0190
12% Term Loan	₹4.00	0.1000(i/e.,4/40)	0.0840	0.0084
	₹40.00			0.1530

Therefore, Weighted average cost of capital = 0.1530 or 15.3%

Working Notes:

(i) Cost of Equity share capital (k_e) =[D_1/P_0]+g = [₹8 / (₹64.25)] + 0.05 = 0.1745 or 17.45%

(ii) Cost of Retained earnings (k_r) = k_e = 17.45%

(iii) Cost of 18% Preference share capital (k_p):

$$= \frac{\text{Preference dividend} + (\text{Redeemable value} - \text{Net sale proceeds})/N}{(\text{Redeemable value} + \text{Net sale proceeds})/2}$$

$$= \frac{₹18 + (₹100 - ₹90)/10}{(₹100 + ₹90)/2}$$

$$= \frac{₹18 + ₹1}{₹95} = 0.20 \text{ or } 20\%$$

(iv) Cost of 12.5% Debentures (k_d):

$$= \frac{\text{Interest}(1 - \text{tax rate}) + (\text{Redeemable value} - \text{Net sale proceeds})/N}{(\text{Redeemable value} + \text{Net sale proceeds})/2}$$

$$= \frac{₹12.5(1 - 0.3) + (₹100 - ₹95)/5}{(₹100 + ₹95)/2}$$

$$= \frac{₹8.75 + ₹1}{₹97.5} = 0.10 \text{ or } 10\%$$

(v) Cost of 12% Term Loan:

$$= \frac{\text{Interest}(1 - \text{tax rate})}{\text{Net sale proceeds}}$$

$$= \frac{₹48,000(1 - 0.30)}{₹4,00,000} = 0.084 \text{ or } 8.4\%$$

7. (a) Hindus Ltd. has to make US $ 5 million payment in three months' time. The required amount in dollars is available with Hindus Ltd. The management of the company decides to invest if for three months and the following information is available in this context:

The US $ deposit rate is 7% per annum.

The Sterling-Pound deposit rate is 9% per annum.

The spot exchange rate is $ 1.42 / £.

The three month forward rate is $ 1.40 / £.

Answer the following questions:

(i) Where should the company invest for better returns?

(ii) Assuming that the interest rates and spot exchange rate remain as above, what forward rate would yield an equilibrium situation?

(iii) Assuming that the US interest rate and the spot and forward rates remain as above, where should the company invest if the Sterling-Pound deposit rate were 12% per annum?

(iv) With the originally stated spot and forward rates and same dollar deposit rate, what is the equilibrium Sterling-Pound deposit rate? 3+3+2+2=10

(b) Classify the following participants of the commodity market under the appropriate category—Hedgers, Speculators and Arbitrageurs: 1×6=6

(i) Warehousing Companies

(ii) Brokerage Houses

(iii) Food Processing Companies

(iv) Farmers

(v) Commodity Consumers

(vi) Retail Investors

Answer:

7. (a) Here, spot = $1.42/ £ ; 3-m Forward = $1.40/£ ; r_h = 7% ; r_f = 9%.

i) For Interest Rate Parity to hold, $(1 + r_h) = (F/S) \times (1 + r_f)$
Now L.H.S = $(1+ r_h) = (1+7/100\times3/12) = 1.0175$;

R.H.S $= (1 + r_f)(F/S)$ where, F = Future Price, S = Spot Price

$= (1+9/100\times3/12)\times1.40/1.42 = (1.0225)(1.40/1.42) = 1.0080$

Since, LHS ≠ RHS, IRP is not holding exactly.
Since LHS > RHS, the Company needs to invest in US $ for better return.

ii) For equilibrium, the interest rate parity equation should match i.e.
$F/S = (1 + r_h) \div (1 + r_f)$
i.e. $F = S \times [(1+ r_h) \div (1 + r_f) = 1.42 \times (1.0175 / 1.0225) = 1.4130$
Only if the forward rate F = 1.4130, we have an equilibrium situation.

iii) Now, if spot = \$1.42/£; 3m Forward = \$1.40/£; r_h = 7%; r_f = 12%; we again check whether Interest Rate Party holds.
Now, LHS = 1.0175; RHS = $(1+ r_f)$ (F/S) = (1.0300) (1.40/1.42) = 1.0155
Since, LHS ≠ RHS, IRP is not holding exactly.
Now since LHS > RHS, the Company needs to invest here also in US $ for better returns.

iv) For equilibrium, the interest rate party equation should match
i.e. $F/S = (1+ r_h) \div (1+ r_f)$.
i.e. $(1+ r_f) = S/F \times (1+ r_h) = (1.42 /1.40) \times 1.0175 = 1.0320$
or r_f = 3.20% (for 3 months)
Only if the annual pound rate is 12.80% (i.e., 3.20 × 4),
we have a equilibrium situation.

Alternative Solution:

(i) Invest in US $ now at 7% × 3 months = 50,00,000 × 7% × 3/12 = 87500.

Total amount in US $ after 3 month =	50,87,500
Convert at current rate into GB £ = 50,00,000/1.42 =	35,21,126.76
Invest pounds for 3 month at 9 %	
= 35,21,126.76 × 9% × 3/12 =	79225.35
Total pounds at the end of 3 month = 35, 21,126.76 + 79,225.35 =	36,00,352.11
Equivalent $ after 3 month at forward rate = 36, 00,352.11 × 1.4 =	50,40,492.95

Benefit = \$ (50,87,500 - \$ 50,40,492.95) = \$ 47,007.05

Hence it is better to invest in US $.

(ii) Forward rate for equilibrium = 50,87,500/36,00,352.11 = 1.41

(iii) If sterling is additional 3 %, i.e. 12 %, 35,21,126.76 × 3% × 3/12 = pounds 26408.45

= 1.4 × 26408.45 = \$36971.83

It is still better to invest in US $.

(iv) Equilibrium sterling pound deposit rate is when at 1.40 forward rate, US $ 50,87,500 is achieved.
i.e. (35,21,126.76 + x/100 × 35,21,126.76 × 3/12) × 1.4 = 50,87,500

i.e., x = 12.8%

7. (b)

(i)	Warehousing Companies	-	Arbitrageurs
(ii)	Brokerage Hours	-	Speculators/Arbitrageurs
(iii)	Food Processing Companies	-	Hedgers
(iv)	Farmers	-	Hedgers
(v)	Commodity Consumers	-	Hedgers
(vi)	Retail Investors	-	Speculators

8. Answer any four of the following: 4×4=16

(a) Differentiate between capital market and money market with respect to the following aspects:
- **(i) Type of Investment**
- **(ii) Participants**
- **(iii) Regulators**
- **(iv) Risk**

(b) List four advantages of the book building process.

(c) State four objectives of cross border leasing.

(d) What are the situations in which Net Present Value (NPV) and Internal Rate of Return (ITR) give conflicting results?

(e) Write a short note on Liquidity Adjustment Facility (LAF).

Answer:

8. (a) Differences between Capital Market and Money Market

Aspect	Capital Market	Money Market
(i) Type of Investment	Debt and Equity Instruments. e.g., Equity Shares, Preference shares, Debentures, Zero Coupon Bonds.	Debt Instruments only. e.g., Treasury Bills, Commercial Papers, Commercial Bills, Certificate of Deposits.
(ii) Participants	Retail Investors, Institutional Investors (Mutual Funds), Financial Institutions, etc.	Bankers, Financial Institutions, Reserve Bank of India, Government.
(iii) Regulator	SEBI	RBI
(iv) Risk	Low Credit and Market Risk involved.	High Credit and Market risk.

8. (b) **Advantages of Book Building Process:**

(i) The book building process helps in discovery of price & demand.
(ii) The costs of the public issue are much reduced.
(iii) The time taken for the completion entire process is much less than that in the normal public issue.
(iv) In book building the demand for the share is known before the issue closes. In fact,

if there is not much demand, the issue may be deferred.

(v) It inspires investor's confidence leading to a large investor universe.

(vi) Issues can choose investors by quality.

(vii) The issue price is market determined.

8. (c) **Objectives of Cross Border Leasing**:

(i) **Overall Cost of Financing:** A major objective of cross boarder leases is to reduce the overall cost of financing through utilisation by the lessor of tax depreciation allowances to reduce its taxable income. The tax savings are passed through to the lessee as a lower cost of finance. The basic prerequisites are relatively high tax rates in the lessor's country, liberal depreciation rules and either very flexible or very formalistic rules governing tax ownership.

(ii) **Security:** The lessor is often able to utilize non-recourse debt to finance a substantial portion of the equipment cost. The debt is secured by among other things, a mortgage on the equipment and by an assignment of the right to receive payments under the lease.

(iii) **Accounting Treatment:** Also depending on the structure in some countries the lessor can utilise very favourable "Leveraged Lease" Financial Accounting treatment for the overall transaction.

(iv) **Repossession:** In some countries, it is easier for a lessor to repossess the leased equipment following a lessee default because the lessor is an owner and not a mere secured lender.

8. (d) **Causes for Conflict:** Higher the NPV, higher will be the IRR. However, NPV and IRR may give conflicting results in the evaluation of different projects, in the following situations:

(i) Initial Investment Disparity, i.e. Different Project Sizes

(ii) Project Life Disparity- i.e. Difference in Project Lives.

(iii) Outflow Patterns, i.e., when cash outflows arise at different point of time during the Project Life, rather than as initial investment (Time 0) only.

(iv) Cash Flow Disparity- when there is a huge difference between initial CFAT and late years CFAT. A project with heavy initial CFAT than compared to later years will have higher IRR and vice versa.

8. (e) **Liquidity Adjustment facility (LAF)**

LAF is facility extended by the Reserve Bank of India to the scheduled commercial banks (excluding RRBs) and primary dealers to avail of liquidity in case of requirement or park excess funds with the RBI in case of excess liquidity on an overnight basis against the collateral of Government securities including State Government securities. Basically LAF enables liquidity management on a day to day basis. The operations of LAF are conducted by way of repurchase agreements with RBI being the counter party to all the transactions. The interest rate in LAF is fixed by the RBI from time to time. LAF is an important tool of monetary policy and enables RBI to transmit interest rate signals to the market.

Table values/measure for use in various answers.

$e^{0.0075}$	=	1.007528
$e^{0.007}$	=	1.00702
$e^{0.07}$	=	1.07250

PV factors:

Year-end	1	2	3	4	5
PV factor @ 12%	0.8929	0.7972	0.7118	0.6355	0.5674
PV factor @ 14%	0.8772	0.7695	0.6750	0.5921	0.5194
PV factor @ 15%	0.8696	0.7561	0.6575	0.5718	0.4972
PV factor @ 4.2%	0.9597	0.9210	0.8839	0.8483	0.8141
PV factor @ 7.8%	0.9276	0.8605	0.7983	0.7405	0.6869
PV factors @ 8%	0.9259	0.8573	0.7938	0.7350	0.6806