FINAL EXAMINATION
GROUP III
(SYLLABUS 2012)

SUGGESTED ANSWERS TO QUESTIONS
DECEMBER 2014

Paper- 14 : ADVANCED FINANCIAL MANAGEMENT

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

The figures in the margin on the right side indicate full marks.
This paper contains 5 question. All questions are compulsory.
Subject to instruction provided against each question.
All workings must form part of your answer.
Assumptions, if any, must be clearly stated.

1. All questions are compulsory: 2 × 10 = 20

(a) Mention any three economic functions of Financial markets 2

(b) Following information is available regarding a mutual fund:

Return	**13**
Risk (σ)	**16**
Beta (β)	**0.90**
Risk free rate	**10**

Calculate Share ratio and Treynor's ratio. 2

(c) Write down the objective of Inter Bank Participation Certificate. 2

(d) What is Rolling settlement? 2

(e) Compute the theoretical forward price of the following security for 6 months.

Spot Price (S_x)	**₹160**
Risk free interest rate	**9%**

[Given: $e^{0.045} = 1.046028$] 2

(f) It is given that ₹/£ quote is ₹100.68 – 102.95 and ₹/$ quote is ₹61.86 – 62.87. What would be the $/£ quote? 2

(g) A project had an equity beta of 1.3 and was going to be financed by a combination of 30% debt and 70% equity. Assuming debt-beta to be zero, calculate the project beta and return from the project taking risk free rate of return to be 10% and return on market portfolio of 18%. 2

(h) Mr. Varun holds portfolio consisting of two stocks, Stock A and Stock B. Stock A has a standard deviation of returns of 0.60 and Stock B has a standard deviation of 0.80. The cor-relation co-efficient of the two stocks' return is 0.50. If Varun holds equal amount of each stock, what will be risk of the portfolio consisting of two stocks? 2

(i) State any two applications of the Behavioural Financial Theory. 2

(j) Arvind Leasing Company is considering a proposal to lease out a school bus. The bus can be purchased for ₹8,00,000 and in turn, be leased out at ₹ 2,00,000 per year for 8 years with payments occurring at the end of each year. What should be the yearly lease payment charged by the company in order to earn 20% annual compounded rate of return before expenses and taxes?
[Given: PVIFA @ 20%, 8 years = 3.837] 2

Answer:

1. (a) (i) Price discovery; (ii) Liquidity; and (iii) reduction of transaction costs.

(b) Sharpe's ratio = $(R_P - R_F) / \sigma$ = [13 -10] / 16 = 0.19

Treynor's ratio = $(R_P - R_F) / \beta$ = [13 -10] / 0.90 = 3.33

(c) IBPCs are short-term instruments. The objective is to even out the short-term liquidity within the banking system particularly when there are imbalances affecting the maturity mix of assets in banking book- thus, they provide a degree of flexibility in the credit portfolio of banks.

(d) 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. Here, settlement refers to the process in which traders who have made purchases make payments while those who have sold shares, deliver them.

(e) Forward price of securities = ₹ 160 × $e^{(0.09)(0.50)}$ = ₹ 160 × $e^{0.045}$ = ₹ 160 × 1.046028 = ₹ 167.3645.

(f) The synthetic rate for $ / £ is to be calculated. Here, rupee, the price currency (i.e. common currency) is the cheapest among the three currencies involved in the quotes. The formula is :
$ / £ = [(₹ / £$_{bid}$)/ (₹ / $$_{ask}$)]: [(₹/ £$_{ask}$)/(₹/ $$_{bid}$)] = [100.68/ 62.87]: [102.95/61.86]

= 1.6014 :1.6642 ; So, $/£ = $1.6014 - $ 1.6642 (quote).

(g) β_p is to be ascertained as -

= [β_{equity} + E / (D +E)] + [β_{debt} + E /(D + E)] = (1.30 × 0.70) + (0 × 0.3) =0.91

Computation of return from the project = $R_F + \beta_p (R_M - R_F)$ = 0.10 + 0.91 × (0.18 - 0.10) = 0.1728 = 17.28 %.

(h) $\sigma_{AB} = \sqrt{[(\sigma_A^2 \times W_A^2) + (\sigma_B^2 \times W_B^2) + 2(\sigma_A \times W_A \times \sigma_B \times W_B \times \rho_{AB})]}$

$= \sqrt{[0.6^2 \times 0.5^2 + 0.8^2 \times 0.5^2 + 2 \times 0.6 \times 0.5 \times 0.8 \times 0.5 \times 0.5]}$

= 0.61 (Risk of the portfolio)

(i) Applications of the Behavioral Finance Theory (any two):
- (i) Learning to recognize mistakes
- (ii) Understanding and adapting to other people's decision making processes.
- (iii) Evaluating market trends
- (iv) Facilitating the planning process
- (v) Impacts of events on the market
- (vi) Promoting products to consumers

(j) Lease rent = [8,00,000/$PVIFA_{8\ years,\ 20\%}$] = 8,00,000/3.837 = ₹2,08,496 p.a.

2. Answer any three questions: 8×3=24

(a) (i) Mention any three key objectives of Commodity Futures. 3

(ii) An investor purchased 300 units of a mutual fund at ₹12.25 per unit on 31st

December, 2012. As on 31st December, 2013 he has received ₹1.25 as dividend and ₹1.00 as capital gains distribution per unit,

Required:

1. **The return on investment if the NAV as on 31st December, 2013 is ₹13.00.**
2. **The return on investment as on 31st December, 2013, if all dividends and capital gains distributions are reinvested into additional units of the fund at ₹12.50 per unit. 5**

(b) (i) Equi – Stable is a portfolio model wherein 20% of Fund value is invested in Fixed Income Bearing Instruments. The balance of 80% is divided among old industry stock (iron and steel), Automotive Industry stock, Information Technology stocks, Infrastructure Company stocks and Financial Services Sector in the ratio of 4:2:6:3:5.

Three mutual funds X, Y and Z offer a fund scheme based on the Equi-stable portfolio model. The actual return on Equi-Stable portfolios of each of the three funds for the past 3 years is as follows:

Year	1	2	3
Portfolio X	17.35%	18.70%	21.60%
Portfolio Y	17.20%	18.25%	22.15%
Portfolio Z	17.10%	18.60%	22.00%

Beta factor of the Equi-Stable portfolio is measured at 1.35. Return on market portfolio indicates that ₹1,000 invested will fetch ₹153 in a year (including capital appreciation and dividend yield). RBI bonds, guaranteed by the Central Government yields 4.50%.

Rate the fund managers of X, Y and Z. 6

(ii) Describe any one risk management procedure of clearing house 2

(c) (i) A sugar mill in Maharashtra is expected to produce 100 MT of sugar in the month of February. The current market price today (the month of December) is ₹22 per kg. February futures contract in sugar due on 20th February is trading at ₹25 per kg. The sugar mill apprehends that the price lesser than ₹25 per kg will prevail in February due to excessive supply then.

How can the sugar mill hedge its position against the anticipated decline in sugar price in February? 6

(ii) Explain any one distinguishing feature of project finance compared to corporate finance. 2

(d) (i) Moonlight mutual fund is an open-end fund with 50 Lakh units outstanding. You buy 2,100 units today. The dividend paid and the closing NAV for 2 years are as follows:

Year	Dividend ₹	NAV ₹
Today	-	19
1	0.20	21
2	0.25	23

Calculate Money Weighted rate of Return (MWROR), if you reinvest dividends. 4

(ii) What you are expected to know about issues in Infrastructure Financing? 4

Answer:

2. (a) (i) The key objectives of commodity futures are:

1. Hedging with the objective of transferring risk related to the possession of physical

assets through any adverse movements in price.

2. Maintaining buffer stock and better allocation of resources as to augment reduction in inventory and thus the exposure to risk declines.
3. Price stabilization that ensures liquidity.
4. Flexibility, certainty, and transparency in purchase of commodities.

(ii) Return for the year (all charges on a per year basis)

Particulars	₹/Unit
Changes in price [13.00 -12.25]	0.75
Dividend received	1.25
Capital gain distribution	1.00
Total return	3.00

Return on investment = [3.00 / 12.25] × 100 = 24.49 %

If all dividends and capital gains are reinvested into additional units at ₹ 12.50 per unit, the position would be :

Total amount reinvested = ₹ 2.25 × 300	= ₹675
Additional units added = ₹ 675 / 12.50	= 54 units
Value of 354 units as on 31.12. 2013	= ₹4,602
Price paid for 300 units on 31.12. 2012 = 300 × ₹ 12.25	= ₹3,675
Return = [4,602 - 3,675] / 3,675 =927/3,675	= 25.22%

(b) (i) Computation of expected rate of return under CAPM:

$E(R_x) = R_F + \text{Beta} \times [R_M - R_F]$; Risk free return = R_f = 4.50 %

Return on market portfolio = R_M = 153 /1000 = 15.30 %
Beta of Equi-stable = 1.35

So, Expected return of Equi-stable = 4.50 % +[1.35 × (15.30 % - 4.50 %] = 19.08 %

Computation of Alpha factor of 3 Funds						
Year	Mutual Funds X		Mutual Funds Y		Mutual Funds Z	
	Actual return	Abnormal return	Actual return	Abnormal return	Actual return	Abnormal return
1	17.35%	17.35 – 19.08 = (1.73)	17.20%	17.20 – 19.08 = (1.88)	17.10%	17.10- 19.08 = (1.98)
2	18.70%	18.70 – 19.08 = (0.38)	18.25%	18.25-19.08 = (0.83)	18.60%	18.60 – 19.08 = (0.48)
3	21.60%	21.60 -19.08 = 2.52	22.15%	22.15-19.08 = 3.07	22.00%	22.00 – 19.08 = 2.92
		0.41		0.36		0.46

Alpha factor:

Fund X = 0.41 / 3years = 0.137 %; Fund Y = 0.36 /3 years = 0.120 %; Fund Z = 0.46 / 3years = 0.153 %

Evaluation: Equitable scheme of mutual fund Z has the highest alpha 0.153 % return more than the market expectations when compared to 0.137 % and 0.120 % of fund X and Y. Therefore, fund manager of Mutual fund Z has performed better.

Ranking: Fund manager Z = 1; Fund manager X = 2 and Fund manager Y= 3.

2. (b) (ii): Risk management procedures of a clearing house are:

1. Imposition of membership requirements, including capital requirements and an on-going monitoring of compliance with such requirements in order to limit the likelihood of defaults.

2. Imposition of security deposits, collateral requirements and exposure ceilings to limit loss by using more than one settlement bank. Another technique to minimize the risk of settlement of bank failure is to convert customer cash held in deposits at the settlement bank into securities, e.g. treasury bonds held by the settlement bank. While a cash deposit account creates a debtor/ creditor relationship between the bank and its customer for the amount on deposit and a customer claim against the assets of the bank in the event of its insolvency, customer securities held by a settlement bank are segregated for the benefit of customer on its books, are not included in the assets upon its insolvency and can be recovered by the customer, free of any claim against the bank.

2. (c) (i) Sugar mill is long on the asset in February. Therefore, it needs to sell the futures contract today. The no. of contracts that needs to be sold is dependent upon the exposure in the physical assets and the value one needs to cover. Assuming each contract for sugar is for 10 M.T. the no. of contracts to be sold is 10.

No. of contracts to be sold = Quantity to be hedged / Quantity in each future contract = 100 M.T./10 M.T. = 10 Contracts.

Sugar mill would go short on futures in December. Prior to February, before the future contract expires, sugar mill buys futures contract to nullify its position in the futures contract. The underlying asset, i.e. sugar is sold in the spot market. Prices realized by sugar mill in two different scenarios of decline or rise in sugar prices, using the principle of convergence of price on the due date of the contract, is worked out as follows:

When the price falls to ₹ 22 per k.g. in the futures contract

Sold futures in December	+25
Bought futures contract in February	-22
Gain in the futures contract	+3
Price realized in the spot mar	+22
Effective price realize	₹25 per k. g.

Here, the loss of ₹3 (₹25 - 22) in the spot market is made up by an equal gain in the futures market.

When the price rises to ₹26 per k.g. in the futures market

Sold futures contract in December	+25
Bought futures contract in February	-26
Loss in futures contract	-1
Price realized in the spot market	+26
Effective price realized	₹25 per k. g.

Here, gain of ₹1 [₹26 – 25] in the spot market is offset by the equal in the futures market.

Note : Due to the fact that prices of sugar in the spot market and future market must converge, a fixed price of ₹25 per kg. is realized by the sugar mill. The loss or gain in the spot market is fully compensated by gain/loss in the future market.

2. (c) (ii) Project financing vs. Corporate financing:

Project finance involves significant costs compared to Corporate finance. The creation of a project company provides an opportunity to create asset- specific, new governance systems to address the conflicts between ownership and control.

Two main distinguishing features are:

(1) Enhanced verifiability of cash flows: In project finance, contractual agreements are possible because of a single, discreet project in legal isolation from the sponsors and the resultant absence of future opportunities. But, corporate finance involves a multitude of future and current projects and so the same contractual agreements cannot be effected.; and

(2) Lack of sponsors, assets, and cash flows: In the case of corporate finance, the lender has a potentially larger pool of cash flows from which to get paid as compared to project finance where the cash flows from the project only are used to pay the investors.

2. (d) (i) MWROR with reinvestment:
When you reinvest 20 p dividend at time 1, the no. of units you buy = [0.2 × 2100] / 21 = 20
Therefore. Total units at the beginning of the 2nd Year = 2100 +20 = 2120.
The cash flow for computing the rupee-weighted return are then:

Time	Return
0	-2100 × 19 = (-) 39,900
1	0
2	2120 × [0.25 + 23] = 49.290

The rupee-weighted return is just the IRR, defined by:
(-) 39,900 + 49,290/(1 + IRR)^2 = 0; OR, IRR = [49,290/39,900]$^{0.5}$ – 1 = 11.1458%

2. (d) (ii): Issues in infrastructure financing:

1. Funding gap: It is the most important issue that we face on the front.
2. Fiscal burden: Here, the point to be noted is that government funds have competing demands, such as education, health, employment generation among others. Given that there is a limit to the govt's financing of infrastructure especially in the context of a rule based fiscal policy framework, it is important to explore other avenues for financing infrastructure.
3. Asset-liability mismatch of commercial banks: It is a well known fact that these are institutions that primarily leverage on short-term liabilities and as such, their ability to extend long-term loans to the infrastructure sector is limited.
4. Take-out financing: This offers a window to the bank to free their balance sheet from exposure to infrastructure loans, lends to new projects and also enables better management of the asset-liability position.
5. Investment obligations of Insurance and Pension funds: These institutions leverage on long-term liabilities. They are constrained by their obligations to invest a substantial portion of their funds in govt. securities. However, this limits the direct investment of these institutions in the infrastructure sector.

3. Answer any two questions: 10 x 2 = 20

(a) (i) From the following data for Government Securities:

Face Value ₹	Interest rate %	Maturity Year	Current Price ₹
1,00,400	0	1	91,900
1,00,400	10	2	98,900
1,00,400	10.5	3	99,400

Calculate the forward rates. 8

(ii) Explain any two processes of Credit rating. 2

(b) (i) Write down any four processes for raising equity through ADRs. 4

(ii) Determine the value of option, both call and put, on expiry for the stock of Nirmal Spice Foods (NSF) Ltd. from the following information:
Exercise Price ₹510

Spot price on exercise date ranges between ₹495 and ₹525 with interval of ₹5. Also state what will be the action on the above range of prices for both the options. 6

(c) The following information is available for Call option on the stock of MACON LTD:

Current market price	**₹415**
Strike price	**₹400**
Time to expiration (1 year = 360 days)	**90 days**
Standard deviation of return	**22%**
Risk-free rate of interest	**5 %**

You are required to compute the value of Call option, using Black- Scholes model.
[Given: $N(d_1) = N(0.5033) = 0.7019$;
$N(d_2) = N(0.3933) = 0.6628$;
Ln (1.0375) = 0.03681; and
e = 2.71828]. 10

Answer:

3. (a)(i)

1. Computation of Zero rates [Implied interstate time zero] [under annual compounding]

Particulars	1 year Bond	2 year Bond	3 year Bond
Current market price (a)	₹ 91,900	₹98,900	₹ 99,400
Redemption price [assumed at par value]	₹ 1,00,400	₹ 1,00,400	₹ 1,00,400
Capital gain (b)	₹8,500	₹ 1,500	₹ 1,000
Rate of interest	0%	10%	10.50 %
Annual interest inflow	-	₹ 10,040	₹ 10,542
Period of bond (c)	1 year	2 year	3 year
Total interest inflow (d)	Nil	₹ 20,080	₹ 31,626
Total income to a Bondholder (e = b + d)	₹ 8,500	₹ 21,580	₹ 32,626
Income per annum (f = e / c)	₹ 8,500	₹ 10,790	₹ 10,875
Implied interest rate (f/a)	9.25 %	10.91 %	10.94%

Computation of Forward rates

(a) Forward rate for year 1 = Implied interest rate for one year bond = 9.25%

(b) Forward rate for year 2:

Factor	Notation	Value
Zero rate for 1 year bond	R_1	9.25 %
Zero rate for 2 year bond	R_2	10.91 %
Tenor of bond 1	T_1	1
Tenor of bond 2	T_2	2
forward rate for year 2 $=[R_2 T_2 – R_1 T_1]/(T_2 –T_1)$ $=\{[10.91 \times 2] - [9.25 \times 1]\} /[2-1] = 12.57$ %	R_F	12.57%

(c) Forward rate for year 3:

Factor	Notation	Value
Zero rate for 2 year bond	R_2	10.91 %
Zero rate for 3 year bond	R_3	10.94 %
Tenor of bond 2	T_2	2
Tenor of bond 3	T_3	3
forward rate for year 3 =$[R_3 T_3 – R_2 T_2]/(T_3 –T_2)$		
={[10.94 × 3] - [10.91 × 2]} /[3- 2] = 11.00 %	R_{F3}	11.00%

3. (a) (ii): Process of credit rating:

The steps are –

1. Rating request - The customer [prospective issuer of debt instrument] makes a formal request to the rating agency. The request spells out the terms of the rating assignment and condition analysis of the issue, viz. historical performance, competitive position, business risk profile, business strategies, financial policies and evaluation of outlook for performance. Information are met through various sources like references, reviews experience, etc.
2. Formation of rating team - The credit rating agency forms a team, whose composition is based on the expertise and skills required for evaluating the business of the issuer.
3. Initial analysis - On the basis of information gathered, the analyst submits the report to the rating team. The authenticity and validity of the information submitted influences the credit rating activity.
4. Evaluation of rating committee - Rating committee is the final authority for assigning ratings. The rating team makes a brief presentation about the issuer's business and the management. All the issues identified during discussion are analysed.
5. Actual rating - Rating is assigned and all the issues, which influence the rating, are clearly spelt out.
6. Communication to issuer -Assigned rating together with the key issues is communicated to the issuer's top management for acceptance. The ratings which are not accepted, are either rejected or reviewed. The rejected ratings are not disclosed and complete confidentiality is maintained.
7. Review of rating - If the rating is not acceptable to the issuer, he has a right to appeal for a rating. These reviews are usually taken up only if the issuer provides fresh inputs on the issues that were considered for assigning the rating. Issuer's response is presented to the rating committee. If the inputs are convincing, the committee can revise the initial rating decision.
8. Surveillance / monitoring - Credit rating agency monitors the accepted ratings over the tenure of the rated instrument. Ratings are reviewed every year, unless warranted earlier. During this course, the initial rating could be retained, upgraded, or downgraded.

3. (b) (i): Process for raising equity:

1. Issue intermediaries: ADRs are issued by the Overseas Depository Bank, who has a Domestic Custodian Bank in India.
2. Deposit of securities: Company willing to raise equity through ADRs should deposit the securities with the DCB in India.
3. Authorisation for issue of ADRs: The Indian company authorizes ODB to issue ADR against the security of the company's equity shares.
4. Issues of ADR: ODB issues ADRs to investors at a predetermined ratio to the company's securities.

5. Redemption of ADR : When redeemed, appropriate no. of underlying equity shares is issued.
6. Dividend / interest: Indian company pays interest to the ODB, which in turn, distributes dividends to the ADR holders, based on the prevailing exchange rate.

3. (b)(ii): Call option[Right to buy]:

Situation	Exercise price (₹)	Spot price on Expiry date (₹)	Value of call [Maximum of SP & EP (₹) {[SP – EP], 0}	Action
A	510	495	495-510 = (-)15 → 0	Lapse
B	510	500	500 - 510 = (-) 10 → 0	Lapse
C	510	505	505 - 510 = (-) 5 → 0	Lapse
D	510	510	510-510 = 0 → 0	Lapse
E	510	515	515-510 = 5 → 5	Exercise
F	510	520	520-510 = 10→ 10	Exercise
G	510	525	525-510 = 15→ 15	Exercise

Put option [Right to sell]:

Situation	Exercise price (₹)	Spot price on Expiry date (₹)	Value of call [Maximum of EP & SP (₹) {[EP – SP], 0}	Action
A	510	495	510 - 495 = 15 → 15	Exercise
B	510	500	510 - 500 = 10 → 10	Exercise
C	510	505	510 - 505 = 5 → 5	Exercise
D	510	510	510- 510 = 0 → 0	Lapse
E	510	515	510- 515 = (-) 5 → 0	Lapse
F	510	520	510 -520 = (-) 10→ 0	Lapse
G	510	525	510 -525 = (-) 15-→ 0	Lapse

3. (c) :

Basic Data :

Factor	Notation	Value(₹)
Current market price	S	415
Strike Price	X	400
Time [90 days]	t	0.25
Risk free rate of return	r	5% or 0.05
Standard deviation of return	σ	0.22

$$d_1 = \frac{[Ln(S/X) + (r + 0.50\sigma^2)x\ t]}{\sigma\sqrt{t}}$$

$=[L_n\ (415/400) + (\ 0.05 + 0.5 \times 0.22^2) \times 0.25\ ] / [\ 0.22 \times \sqrt{0.25}]$

$= [L_n\ (1.0375) + 0.01855] / 0.11 = [0.03681 + 0.01855\ ] / 0.11 = 0.05536 / 0.11 = 0.5033$

$d_2 = d_1 : - \sigma\sqrt{t} = 0.5033 - [0.22 \times \sqrt{0.25}] = 0.5033 - 0.1100 = 0.3933$

So, $N(d_1) = N\ (0.5033) = 0.7019$; AND $N(d_2) = N\ (0.3933) = 0.6628$

Hence, value of call option = $[S \times N(d_1)] - [\ X\ x\ e^{-rt} \times N(d_2)]$

$= [415 \times 0.7019] - [400/(2.71828)^{0.05 \times 0.25} \times 0.6628]$

$= [291.2885] - [400/1.01258 \times 0.6628\ ] = [291.2885] - [261.8266] = 29.46$

4. Answer any two questions: 8×2 = 16

(a) As an investment manager, you are given the following information:

Investment	Initial Price (₹)	Dividend (₹)	Market Price (₹)	Beta
Equity Shares of				
A Ltd.	70	5	140	0.8
B Ltd.	80	5	150	0.7
C Ltd.	90	5	270	0.5
Govt. of India bonds	1,000	160	1,010	0.95

Risk-free return may be taken at 16%.

Required:

(1) Expected rate of return of Portfolio using CAPM.

(2) Average return of Portfolio. 6+2=8

(b) A company has a choice of investments between several Equity- oriented Funds. The company has an amount of ₹1 crore to invest. The details of the funds are as follows:

Mutual Funds	M	N	o	P	Q
Beta	1.7	1.0	0.9	2.1	0.7

Required:

(1) If the company invests 20% of its investments in the first two mutual funds, and an equal amount in the mutual funds O, P and Q, what is the beta of the portfolio?

(2) If the company invests 15% of its investments in O, 15% in M, 10% in Q and the balance in equal amount in the other two mutual funds, what is the beta of the portfolio?

(3) If the expected return of the market portfolio is 14% at a beta factor of 1.0, what will be the portfolio's expected return in both the situations given above? 3+3+2=8

(c) (i) Yamuna Ltd. is an un-levered firm and undertakes three projects A, B and C. The risk-free rate of return is 8% and the return from the market is 12%. The projects have a weight of 0.5, 0.3 and 0.2 respectively. Their respective betas are 1.3,1.0 and 0.8.

You are required to compute:

(1) Expected return from each project;

(2) Expected return for the company; and

(3) Cost of capital. 2×3= 6

(ii) The risk-free rate of interest is 4.25% and market return is 12%. Beta value of Security B is 2.10. Assume that you had purchased Security B a year ago for ₹312. Current market price is ₹380. Since the price is going up, your friend advises to buy more units of Security B, before it touches ₹400 mark.

What is your decision? 2

Answer:

4. (a) Calculation of expected rate of returns of Portfolios:

Investment	Amount (₹)	Market price (₹)	Capital gain (₹)	Dividend (₹)	Total (₹)
Equityshares of					
A	70	140	70	5	75
B	80	150	70	5	75
C	90	270	180	5	185

Govt. of India bonds	1,000	1,010	10	160	170
Total	1240	1570	330	175	505

Expected rate of return on portfolio = [505/1240] × 100 = 40.73 %.

CAPM Model

$E[RP] = R_F + \beta \times [R_M - R_F]$

A Ltd = 16 + 0.8 [40.73 -16] = 35.78 %

B Ltd = 16 + 0.7 [40.73 - 16] = 33.31 %

C Ltd = 16 + 0.5 [40.73 - 16] = 28.37 %

G of I Bonds = 16 + 0.95 [40.73 - 16] = 39.49 %

(ii) Simple average return of portfolio = [35.78 + 33.31 + 28.37 + 39.49] / 4 = 136.95 / 4 = 34.24 %

Average of Beta = [0.80 + 0.70 + 0.50 + 0.95] /4 = 0.7375.

ALTERNATIVE APPROACH for Average return:

Weighted average return:

Securities	Cost	Proportion	Expected return	Weighted return %
A	70	0.056	35.78	2.004
B	80	0.065	33.31	2.132
C	90	0.073	28.37	2.043
G. Bonds	1,000	0.806	39.49	31.829
	1,240	1.000		38.008

4. (b) Investment in M and N at 20 % each, equal proportion in O, P, and Q.

Mutual Fund	Proportion of Investment	Beta	Proportion × Fund beta
M	0.2	1.7	0.34
N	0.2	1.0	0.20
O	0.2	0.9	0.18
P	0.2	2.1	0.42
Q	0.2	0.7	0.14
Portfolio beta			1.28

Investment in O, P, & Q = [1 – Investment in M and N]/3 = 0.6/3 = 20%

Investment in M at 15%, O at 15% and Q at 10%, equal proportion in N and P:

Mutual Fund	Proportion of Investment	Beta	Proportion × Fund beta
M	0.15	1.7	0.255
N	0.30	1.0	0.300
O	0.15	0.9	0.135
P	0.30	2.1	0.630
Q	0.10	0.7	0.070
PORTFOLIO BETA			1.390

Investment in N and P = [1- INVESTMENT in M, O, and Q]/ 2 = [1 - 0.15 - 0.15 - 0.1] / 2 = 0.30 = 30 %

Expected return from portfolio: Note / Assumption : In the absence of risk-free rate of return, it is assumed that the expected return from portfolio is to be computed using Market model, i.e., there is no risk-free return, and the entire fund return moves in line with the market return. CAPM is not applicable.

Expected return = Market return × Portfolio

Situation	Return in %	Return in ₹
A	14% × 1.28 = 17.92%	100 lakhs × 17.92% = 17.92 lakhs
B	14% × 1.39 = 19.46%	100 lakhs × 19.46% = 19.46 lakhs

4. (c) (i)

[1] Expected return from each project: $R_A = R_F + \beta [R_M - R_F]$

Project	Calculation	Project's return
A	8 + 1.3 × [12- 8]	13.2
B	8 + 1.0 × [12- 8]	12.0
C	8 + 0.8 × [12 - 8]	11.2

[2] Expected return of the asset portfolio of the company:

Project	Weight	Return	W × R
A	0.5	13.2	6.60
B	0.3	12.0	3.60
C	0.2	11.2	2.24
Total			12.44

Overall cost capital: Method 1: Overall cost capital = R_A = 12.44%

Method 2:

	PROJECT	WEIGHT	BETA	TOTAL BETA
	A	0.5	1.3	0.65
	B	0.3	1.0	0.30
	C	0.2	0.8	0.16
Total				1.11

Working note: CAPM used

$K_e = R_F + \beta [R_M - R_F] = 8 + 1.11 \times [12 - 8] = 12.44$ %.

4. (c) (ii) :

CAPM Return = $R_F + \beta[R_M - R_F] = 4.25 + 2.10 \times [12 - 4.25] = 20.525$ %

Annual Return = (380 - 312)/ 312 = 0.217948 = 21. 80 %

The security is marginally undervalued. The difference is 1.27 % return. The decision is to BUY.

5. Answer any two questions: 10×2=20

(a) A company requires ₹27 lakhs for the installation of a new unit, which would yield an annual EBIT of ₹4,50,000. The company's objective is to maximize EPS. It is considering the possibility of issuing Equity shares plus raising a debt of ₹5,40,000, ₹10,80,000 and ₹16,20,000. The current market price per share is ₹90 which is expected to fall to ₹72 per share if the market borrowing were to exceed ₹12,60,000.

The costs of borrowing are indicated as follows:

Level of borrowing	**Upto ₹ 3,60,000**	**₹ 3,60,000 to ₹ 10,80,000**	**₹10,80,000 to ₹ 16,20,000**
Cost of borrowing	**12% p.a.**	**15% p.a.**	**17% p.a.**

Assuming a tax rate of 50%, work out the EPS and the Scheme which you would recommend to the company. 8+2=10

(b) (i) Write down the basic differences between Factoring and Forfeiting. 4
(ii) Determine the risk- adjusted net present value of the following projects: 6

Projects	A	B	C
Net cash outlays (₹)	1,00,000	1,20,000	2,10,000
Project life	5 years	5 years	5 years
Annual cash inflow (₹)	30,000	42,000	70,000
Co-efficient of variation	0.4	0.8	1.2
Risk-adjusted discount rate	12%	14%	16%
PV factor 1 to 5 years at risk-adjusted discount rate	3.605	3.433	3.274

(c) Indira ammusement park charges ₹200 each for all rides in the park. Variable costs amount to ₹ 50 per ride and fixed costs are ₹120 Lakhs. Last year's net income was ₹ 90 Lakhs on sale of ₹280 Lakhs. This year, management expects a cost increase of 20% in variable costs and 10% in fixed costs. To help offset these increases, the management is considering raising the price of a ride to ₹250.
Required:
(i) How many rides did this park sell last year?
(ii) If the price increase is not implemented, what is the expected net income for this year assuming the same volume of activity?
(iii) Compute the price indifference point for the new ride price.
(iv) Compute the Break-even point for this year using the old price and the new price. 2+3+3+2=10

Answer:

5. (a) Statement showing EPS UNDER DIFFERENT SCHEMES:

Particulars	Scheme 1	Scheme 2	Scheme 3
Capital required (₹)	27,00,000	27,00,000	27,00,000
Less : Debt content (₹)	5.40,000	10,80,000	16,20,000
Balance Equity capital required	21,60,000	16,20,000	10,80,000
Market price per share	₹ 90	₹ 90	₹ 72
No. of equity shares to be issued [Equity capital / MPS]	24,000	18,000	15,000

Profitability statement (Amount in ₹)

	Scheme 1	Scheme 2	Scheme 3
EBIT	4,50,000	4,50,000	4,50,000
Less: Interest on Debt 1st 3,60,000 at 12 %	43,200	43,200	43,200
Next 7,20,000 at 15 %	27,000	1,08,000	1,08,000
Balance at 17%			91,800
Total interest	70,200	1,51,200	2,43,000
EBT	3,79,800	2,98,800	2,07,000
Less: Tax at 50 %	1,89,900	1,49,400	1,03,500
EAT	1,89,900	1,49,400	1,03,500
Earning per share(EPS) = EAT/ No. of shares	7.91	8.30	6.90
Average interest rate			

= Total interest / Debt	13%	14%	15%
ROCE = EBIT/ Capital employed	16.67%	16.67 %	16.67 %

Conclusion : EPS is maximum under Scheme 2 and hence, preferable.

Leverage effect: Use of debt funds and Financial leverage will have a favourable effect only if ROCE > INTEREST RATE. ROCE is 16.67 % and hence upto 15 % interest rate i.e., Scheme 2, use of debt will have a favourable impact on EPS and ROE. However, when interest rate is higher at 17 % financial leverage will have negative impact and hence EPS falls from ₹ 8.30 to ₹ 6.90.

5. (b) (i) : The basic difference are:

Basis	Factoring	Forfeiting
Extent of finance	Usually 80% or 90% of the Value of invoice is considered for advance.	100% financing
Credit worthiness	Factor does the credit rating of the counter party in case of a non- recourse factoring transaction	The forfeiting bank relies on the credibility of availing bank.
Services rendered	Day-to-day administration of sales and other allied services are provided.	No services are provided.
Maturity	Advance are short-term in nature	Advances are generally medium term.

(b) (ii) Statement showing Determination of Risk-adjusted Net Present Value

Projects	Net cash Outlays (₹)	Co- Efficient of variation	Risk-adjusted Discount rate	Annual cash Inflow (₹)	PV factor 1-5 years at risk- adjusted discount rate	Discounted Cash inflow (₹)	Net present value (₹)
A	1,00,000	0.4	12%	30,000	3.605	1,08,150	8,150
B	1,20,000	0.8	14%	42,000	3.433	1,44,186	24,186
C	2,10,000	1.20	16%	70,000	3.274	2,29,180	19,180

5. (c)

(i) Rides which INDIRA AMUSEMENT PARK sold last year:

= Total sales of rides last year / Charges per ride last year = ₹ 2,80,00,000 / ₹ 200 = 1,40,000 rides.

(ii) Expected net income:

Charges per ride	₹200
Less: Expected variable cost per ride [₹ 50 + ₹ 10]	₹60
Contribution per ride	₹140

No. of rides (same as last year)	1,40,000
Total expected contribution	₹1,96,00,000
Less : Expected fixed cost [1,20,00,000 + 10 %]	₹1,32,00,000
Expected net income	₹64,00,000

(iii) Price indifference point for the new ride price:
Price indifference point is at which the expected profit remains the same irrespective of sale price and costs:

Particulars	₹
New ride price	250
Less: Variable cost	60
Contribution per ride	190
Fixed cost of this year [A]	1,32,00,000
Net income last year [B]	90,00,000
Contribution required [A + B]	2,22,00,000

Price indifference point = ₹ 2,22,00,000/ ₹ 190 = 1,16,842 rides.

(iv) Break-even point for this year using the old price and the new price:

Break-even point = Fixed costs / Contribution per ride

At old price = ₹ 1,32,00,000 /₹ [200 - 60] = 94,286 rides

At new price = ₹ 1,32,00,000 / ₹ [250 - 60] = 69,474 rides.