FINAL EXAMINATION

GROUP III

(SYLLABUS 2012)

SUGGESTED ANSWERS TO QUESTIONS

DECEMBER 2013

Paper- 14 : ADVANCE FINANCIAL MANAGEMENT

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

The figures in the margin on the right side indicate full marks.
Answer Question No. 1 which is compulsory.
From Section A: Answer any two questions.
From Section B: Answer any one question.
From Section C: Answer any one question.
From Section D: Answer any one question.

1. Answer all questions:

(a) Mr. Kiritee Prasad can earn a return of 16 per cent by investing in equity shares on his own. Now he is considering a recently announced equity-based Mutual Fund Scheme in which initial expenses are 5.70 per cent and annual recurring expenses are 1.70 per cent. How much should the Mutual Fund earn to provide Mr. Kiritee Prasad a return of 16 per cent? 3

(b) The following table gives details of the market value of a Pharma Fund of a portfolio manager during the year along with the value of cash flows into the Fund:

(₹ in crores)

Time (years)	Market value of Pharma Fund	Cash flow
0.25	93	(+) 5
0.50	99	(+) 2
0.75	105	(+) 7
1.00	115	—

The value of the Fund at the beginning was ₹ 90 crores. Calculate Time Weighted Rate of Return (TWROR). 3

(c) (i) Draw a relationship between call option and put option in put-call Parity theory. 3

(ii) A 8-version Laptop is priced at $ 461.5 at New York. The same version Laptop is priced ₹ 30,500 in New Delhi.
Calculate the exchange rate in New Delhi, if over the next year, price of the Laptop increased by 8% in New Delhi and 5% in New York.
Determine the price of Laptop at New Delhi and New York. 2

(d) The Beta Co-efficient of Moon Light Ltd. is 1.40. The Company has been maintaining 8% rate of growth in dividends and earnings. The last dividend paid was ₹ 4 per share. Return on Government securities is 12% Return on Market Portfolio is 18%. The current market price of one share of Moon Light Ltd. is ₹ 32.
What will be the equilibrium price per share of Moon Light Ltd.? 2

(e) The equity of Southern India Automobiles Ltd. (SIAL) is ₹ 750 crores. Its Debt is worth ₹ 330 crores. 84% of the value is attributable to CAR & AUTO Accessories segment which has an Asset Beta of 1.25. The balance value is applied on MISC. Accessories division, which has an Asset Beta of 1.10. Compute Equity Beta, if the Debt Beta is 0.15. 2

(f) ADITYA BIRLA CHEMICALS LTD. adopts constant WACC approach and believes that its cost of Debt and Overall Cost of Capital is at 9% and 12% respectively. If the ratio of the market value of Debt to the market value of Equity is 0.8, what rate of return do Equity Shareholders earn? (Assume that there are no taxes.) 3

(g) The Capital of Pigments Ltd. is as follows:

9% preference shares of ₹ 10 each	**₹ 3,00,000**
Equity shares of ₹ 10 each	**₹ 8,00,000**
Following further information is available:	
Profit after tax	**₹ 2,70,000**
Equity dividend paid	**20%**
Market price of Equity Shares	**₹ 40 each**

Compute: Earnings Per Share (EPS) and Price Earning Ratio (PE Ratio). 2

Answer:

1. (a) Let the return on Mutual fund be ₹ X. Investor's expectation denotes the return from the amount invested.

Returns from Mutual Funds = (Investor's expectation) / (100 - Issue expenses) + Annual recurring expenses;

Or, X = [16 / (100 - 5.7)%] + 1.7 = 16.97 + 1.70 = 18.67%. Hence, Return that Mutual Fund should earn so as to provide a return of 16% = 18.67%.

(b) TWROR: (1+ i) = (93 / 90) x (99 / 98) x (105 / 101) x (115 / 112);
Or, 1+ i = 1.11432; or, i = 0.11432 = 11.43%.

(c) (i) 'Put-Call Parity theory' is the relationship between the price of the European Call Option and Put Option, when they have the same strike price and maturity date, namely that a Portfolio of long a call option and short a put option is equivalent to a single forward contract at the strike price and expiry. This is because if the price at expiry is above the strike price, the call will be exercised, while it is below, the put will be exercised. Thus, in either case, one unit of the asset will be purchased for the strike price, exactly as in a forward contract.

Theory: C+ PV of EP = SP + P, Where, C = Call option premium; EP = Exercise price; SP = Current stock price; and P = Put option premium.

(ii) Exchange rate in New Delhi per $ = [Laptop price at New Delhi] / [Laptop price in $ at New York]
= [₹ 30,500 / $ 461.5] = ₹ 66.09.
Price in a year's time: New Delhi = Prevailing price x (1 + increase in rate)
= 30,500 x (1 + 8%) = ₹ 32,940.
New York = US $ 461.5 x 1.05 = $ 484.58.

(d) Required rate of return [based on CAPM]:
= R_F + BETA x (R_M - R_F) = 12% +1.40 x [18% - 12%] = 20.4%.

Equilibrium price:
Expected Return - [D_1 / (P_0 + G)]; D_1 = 4 x (1 + 8%) = ₹4.32 and G = 8%.
20.4% = [4.32 / Equilibrium price] + 8%. Hence, Equilibrium price = ₹ 34.84.

(e) Asset Beta B_A = Weighted average of Betas of all the projects = W_{CA} X B_{CA} + W_{MA} X B_{MA};
Since, Beta of Levered firm = Beta of its Asset; B_{SIAL} = Beta of its Asset = W_{CA} X B_{CA}+ W_{MA} X B_{MA};
= 84% x 1.25 + (1 - 84%) x 1.10= 1.05 + 0.176 = 1.226;
Equity Beta B_E = [(Value x B_{SIAL})-(Debt x B_D)]/E = [(1,080 x 1.226) - (330 x 0.15)]/750 =1.699.

(f) Constant WACC implies the use of Net Operating Income or MM approach.
Under MM approach, K_E = K_0 + Risk premium. So, K_E = K_0 + (K_0 – K_D) x Debt /Equity;
Hence, K_E = 12% + (12% - 9%) x 80% = 0.144 = **14.4%.**

ALTERNATIVE SOLUTION of (f): K_E can be obtained as a balancing figure as under;
Debt/Equity = 0.8 = 4: 5;

Component	%	Individual cost in %	WACC%
Debt	4/9	K_D = 9%	9% x 4 / 9 = 4%.
Equity	5/9	K_E = 8.00 / (5 / 9) **=14.40%**	12% - 4% = 8%.
		[Final balancing figure]	[Balancing figure].

(g) EPS=[PAT - Preference dividend]/No. of Equity shares = [2,70,000-27,000]/80,000= **₹ 3.04.**
P.E Ratio = Market price / EPS = 40 / 3.04 = **13.16.**

SECTION A
(Answer any two of the following.)

2. (a) Following information is available regarding four Mutual Funds:

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

Risk free rate of return 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.
(b) What makes commodity trading attractive?
(c) Distinguish between 'Inter Corporate Deposits' and 'Public Deposits'. 6+3+3=12

Answer:

2. (a) Sharpe Ratio = (R_p- R_f)/σ_p; and Treynor's Ratio = (R_p- R_f)/β_P.
Where R_P = return on Portfolio
R_f = Risk-free return
σ_p = Standard deviation of portfolio
β_P = Beta of portfolio

Mutual Fund	Under Sharpe's method	Ranking	Under Treynor's method	Ranking
A	(12 - 10) / 15 = 0.133	3	(12 -10)/0.80 = 2.5	3

B	(16-10)/22 = 0.27	2	(16 -10) / 0.76 = 7.89	2
C	(21 -10)/ 37 = 0.30	1	(21 -10) / 1.15 = 9.57	1
D	(13 -10)/24 = 0.125	4	(13 -10) / 1.32 = 2.27	4

Rank in both methods is same. This indicates that all the Mutual Funds seem to be reasonably well diversified.

(b) Commodity trading is attractive for the following reasons -
(i) A good low-risk portfolio diversifier.
(ii) A highly liquid asset class, acting as a counter-weight to stocks, bonds and real estates.
(iii) Less volatile, compared with equities and bonds.
(iv) Investors can leverage their investments and multiply potential earnings.
(v) Better risk-adjusted returns.
(vi) A good hedge against any downturn in equities or bonds.
(vii) Little co-relation with equity and bond markets.
(viii) High co-relation with changes in inflation.
(ix) No securities transaction tax levied.

(c) Inter-corporate Deposits: (i) Short term finance; (ii) Deposits made by one company to another company and are subject to the provisions of the Companies Act 1956; (iii) Rate of interest varies depending upon amount involved and time period; and (iv) the risk is very high.
Public Deposits: (i) Both short term and medium term finance; (ii) Deposits from public and shareholders, subject to the rules prescribed by RBI; (iii) The maximum amount that can be raised, maturity period, and procedures as per conditions laid down by the RBI; (iv) These deposits are unsecured loans and are used for working capital requirements.

3. (a) Who are the participants of Commodity Market?
(b) Explain the following commonly used terms in Commodity Market:
(i) Forward contract
(ii) Futures market
(c) Explain 'Final Settlement' and 'Pay-out mechanism of final settlement' in a clearing house.
3+4+5=12

Answer:

3. (a) Participants of Commodity market:
(i) Hedgers: They buy or sell in the futures market to secure the future price of a commodity intended to be sold at a later date in the cash market. They are producer, farmer, consumers, and food processing companies, etc.
(ii) Speculators: They aim to profit from the very price change that hedgers are protecting themselves against. They are brokerage houses, retail investors and people involved in commodity spot trading.
(iii) Arbitragers: They help to equalize prices and restore market efficiency. They are brokerage houses, warehousing companies, and people in commodity spot trading.

(b) (i) Forward contract: It is an agreement between two parties to buy or sell an asset at a future date for price agreed upon while signing agreement. Forward contract is not traded on an exchange. This is oldest form of derivative contract. Size of forward contract is customized as per the terms of agreement. The contract price is not transparent as it is not publicly discloses. It is generally settled by physical delivery. Delivery is carried out at the delivery centre specified in the customised bilateral agreement.

(ii) Futures market: It is an agreement between two parties to buy or sell a specified and standardized quantity and quality of an asset at certain time in the future at price

agreed upon at the time of entering into contract on the future exchange. It is entered on centralized trading platform of exchange. It is standardized in terms of quantity as specified by exchange. Contract price of futures contract is transparent as it is available on centralized trading screen of the exchange. Futures contract is generally cash settled but option of physical settlement is available. Delivery tendered in case of Futures contract should be of standard quantity and quality as specified by the exchange. Future contract is more liquid as it is traded on on the exchange.

(c) On the date of expiry of future contract, the final settlement price is the spot price on the expiry day. The spot prices are collected from members across the country through polling. The polled bid/ask prices are bootstrapped and the mid of the two bootstrapped prices is taken as the final settlement price. The responsibility of **'Final settlement'** in a clearing house is on a trading-cum-clearing member for all trades done on his own account and his client's trades. A professional clearing member is responsible for settling all the participants' trade which he has confirmed to the exchange.

Pay-out mechanism: Commodity - (1) Credit given to the buyer member Clearing Member Pool A/C; (2) Instruction by member to transfer from CM Pool to buyer client's Demat Account; (3) Subsequent Remat of commodities and physical movement handled by buyer.

Funds - Funds pay-out is done into the designated bank account of the member with the clearing house.

4. Explain in brief:
(i) SEBI regulations and
(ii) RBI Guidelines relating to infrastructure sector. **12**

Answer:

4. In order to augment and accelerate capital funding in the form of long-term debts for Govt., infrastructure projects and provide a framework for setting up and operating IDFs [Infrastructure Debt Funds], the SEBI notified an amendment to SEBI [Mutual Funds] Regulations, 1996 to include a new chapter VI - B. The RBI also notified broad parameters allowing banks and non-banking financial companies to set up IDFs [called RBI Guidelines].

(i) IDFs under SEBI (MF) Regulations:

1. Eligibility for launching an IDF scheme - As per Mutual Fund (MF) regulations, an existing mutual fund may launch an IDF scheme if it has an adequate number of key personnel having adequate experience in the infrastructure sector. MF regulations further provide that an applicant who wishes to launch 'only' IDF schemes may be allowed to do so if the "sponsor' or the parent company of the 'sponsor' has been (a) carrying on activities or business in infrastructure financing for a period of at least 5 years, and (b) fulfills a further eligibility criteria mentioned in MF regulations.

2. Structure of IDF scheme: This scheme can be either floated as a close-ended scheme with a minimum 5 year maturity period or as an open-ended scheme with a lock-in-period of 5 years with 'interval periods' of less than a month. Units issued under any of these schemes to investors have to be listed in a recognized stock exchange. The IDF scheme must have a commitment of minimum INR 250 million from a minimum of 5 'strategic investors'. Each strategic investor is required to contribute a minimum of INR 10 million with no one holding more than 50% of the net assets of the IDF scheme. Each unit issued must be of a minimum INR 1 million and can be partly paid at the time of issuance.

For better monitoring, SEBI has recently come out with draft SEBI [Alternative Investment Funds] Regulations 2011 proposing to make it mandatory for all private pools of capital including debt funds and infrastructure equity funds to register with it.

3. Permissible investments: The MF regulations mandate for investment of at least 90% of the net assets of the IDF scheme in debt securities or securitized debt instruments of infrastructure companies. They can also invest in projects or special purpose vehicles that are specifically created for the purpose of facilitating or promoting investment in the infrastructure sector. SEBI has also allowed IDFs - MF to re-finance bank loans for existing and revenue generating infrastructure projects.

   The remaining 10% of net assets of IDFs are permitted to be invested in equity shares, convertibles including mezzanine financing instruments of both stock listed and unlisted companies engaged in infrastructure or related infrastructure development projects. Further, there is a cap of 30% of the net assets for investment in debt securities or assets of any single infrastructure company or project or bank loan given in respect of completed and revenue generating infrastructure projects. However, this limit can extend to 50% upon approval by board of trustees and the asset management company of the scheme. IDFs can invest up to a minimum of 25% of their net asset in listed securities of the 'sponsor' or his associate or group company. Such investments are subject to a prior approval from the trustees and a complete disclosure to investors in this regard.

4. Taxation of IDFs and valuation of their assets: All incomes accruing to the IDF - MFs will be exempted from income tax. MF regulations mandate for a valuation 'in good faith' by the asset management company of the assets held by IDF.

5. Disclosures in offer document and transaction by employees: MF regulations prescribe that the offer document of an IDF scheme shall contain adequate disclosure to equip investors for making an informed investment decision. These regulations also make it mandatory for the employees or directors of the asset management company or the trustee company to make a disclosure of any transactions done with the investee companies within one month of completion of the transaction to the compliance officer.

(ii) **RBI Guidelines:** Any investments by banks and NBFCs in IDF schemes will require a prior approval from the RBI. RBI guidelines prescribe various thresholds for investment in trust based IDFs by banks and NBFCs. Banks acting as sponsors to IDF - MFs will be subject to existing prudential limits on investment in financial services companies and their capital market exposure while NBFCs will need to have at least $ 60 million as net owned funds. Some of the key features of RBI guidelines are -

1. 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;
2. They should be assigned a minimum credit rating 'A' or equivalent of CRISIL, FITCH, etc.
3. They are allowed to invest in Public-Private-Partnership projects and post-commercial operation date infrastructure projects.
4. Income of IDFs - NBFC will be exempted from income tax and withholding tax on interest payments on the borrowings has been reduced.
5. 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 IRDA (Insurance Regulatory and Development Authority), it is mandatory for insurance companies to direct 15% of their investment towards infrastructure.

SECTION B
(Answer any one of the following.)

5. (a) The following table shows interest rates and exchange rates for the US Dollar and French Franc. The spot exchange rate is 7.05 Francs per Dollar. Complete the missing entries:

	3 months	6 months	1 year
Euro-dollar interest rate (Annual)	**11.5%**	**12.25%**	**?**
Euro-franc interest rate (Annual)	**19.5%**	**?**	**20%**
Forward Francs per dollar	**?**	**?**	**7.52**
Forward discount on Franc (% per year)	**?**	**(6.3%)**	**?**

(b) Estimate the disadvantages of Book Building system, in relation to Indian Capital Market.

(c) The following two-way quotes appear in the Foreign Exchange Market:

	Spot	2 months forward
₹ / US $	**₹ 46.00 / 46.25**	**₹ 47.00 / 47.50**

Required:

(i) How many US Dollars should a firm sell to get ₹ 25 lakhs after 2 months?

(ii) How many Rupees is the firm required to pay so as to obtain US $ 2,00,000 in the spot market?

(iii) Assume that the firm has US $ 69,000 in current account earning interest. ROI on Rupee investment is 10% per annum. Should the firm encash the US $ now or 2 months later?

10+4+6=20

Answer:

5. (a)

Particulars	3 Months	6 Months	1 Year
Euro Dollar interest rate [Annual]	11.5%	12.25%	**12.50%**
Euro Franc interest rate [Annual]	19.5%	**18.94%**	20.00%
Forward Francs per Dollar	**7.1871**	**7.2721**	7.52
Forward Discount on Franc [per cent per year]	**(7.78%)**	(6.3%)	**(6.67%)**

Working notes:

1. Spot rate 1$ =7.05 Francs;
2. 3 Months forward: (for $ 1)
   = Spot rate x [(1 + Francs interest rate for 3 months) / (1 + Euro dollar interest rate for 3 months)]
   = 7.05 Francs x [(1 + 19.5% / 4) / (1 + 11.5% / 4)] = **Fr. 7.1871. [Interest rate parity method]**
3. Forward Discount rate [3 months]
   = [(Forward rate - Spot rate) / Spot rate] x 100 x 12 / (no. of months forward rate)
   = [(7.1871 - 7.05) / 7.05] x 100 x (12 / 3) = **7.78%.** [Annualised].
4. 6 months Forward rate:
   = Spot rate x [1 + (Discount rate x No. of months forward /12)]
   = Fr.7.05 x [1 + (6.3% x 6/12)] = **Fr. 7.2721.**
5. Franc interest rate [6 months] = Assuming Franc interest rate = X, applying the same in Interest rate Parity Formula for determining Forward Rate -

   Forward Rate
   = Franc Spot rate x [(1 + Francs interest rate for 6 months) / (1 + Euro Dollar interest rate for 6 months)]
   Fr. 7.2721 = Fr. 7.05 x (1 + X/2) / (1 + 12.25% / 2);
   or, Fr. 7.2721 = Fr. 7.05 x (1 + X/2) / (1 + 6.125%); or, X = **18.94%.**

6. Euro Interest Rate [1 year] = Assuming Euro interest rate = X, applying the same in interest rate parity formula for determining Forward Rate —

Forward Rate
= Franc Spot rate x [(1 + Francs Interest Rate for 1 year) / (1 + Euro Dollar interest rate for 1 year)]
Fr. 7.52 = Fr. 7.05 x [(1 + 20%) / (1 + X); Or, X = **12.50%.**

7. Forward Discount Rate
= [Forward rate - Spot rate] / [Spot rate x 100 x 12 / (no. of months forward)]
= [(7.52 - 7.05) / 7.05] x 100 x [12 / 12 months] = 0.0667 = **6.67%.**

(b) Book building system is part of initial public offer (IPO) of Indian Capital Market. Following are the disadvantages:
1. There is a possibility of price rigging on listing as promoters
2. The system works very efficiently in matured market conditions. Such conditions are not found in India.
3. It is appropriate for mega issues only.
4. The company should be fundamentally strong and well known to investors; without it, Book building process will be unsuccessful.

(c)
(i) US $ required to get ₹ 25 Lakhs after 2 months at the rate of ₹ 47.00 per $.
Hence, ₹ 25,00,000 / ₹ 47.00 = US $ 53191.489.
(ii) ₹ required to get US $ 2,00,000 now at the rate of ₹ 46.25 per $.
Hence, US $ 2,00,000 x ₹ 46.25 = ₹ 92,50,000.
(iii) En-cashing US $ 69,000 Now Vs. 2 months later
Proceeds if we can en-cash in open market $ 69,000 x ₹ 46.00 = ₹ 31,74,000.
Opportunity gain = 31,74, 000 x (10 /100) x (2 /12) = ₹ 52,900.
Likely sum at end of 2 months = ₹ 32,26,900.
Proceeds if we can en-cash by Forward rate: $ 69,000 x ₹ 47.00= ₹ 32,43,000.

It is better to en-cash the proceeds after 2 months and get opportunity gain.

ALTERNATIVE SOLUTION: For Part (iii) only:

Evaluation of investment in Rupee:
Forward Premium (for Bid rates)
= [(Forward rate ₹ 47 - Spot rate ₹ 46)/ Spot rate ₹ 46] x (12 months / 2 months) x 100.
= 13.04%.
Observation and conclusion: Annualised forward premium for Bid rates (13.04%) is greater than the Annual return on investment in Rupees (10%). Therefore, the firm should not en-cash its US $ balance now. It should sell the US $ in the forward market and en-cash them two months later.

6. (a) DS Inc. is considering a new plan in Netherlands. The Plan will cost 26 million Guilders. Incremental cash flows are expected to be 3 million Guilders per year for the first 3 years. 4 million Guilders for the next 3, 5 million Guilders in years 7 to 9, and 6 million Guilders in years 10 through 19, after which the project will terminate with no residual value.

The present exchange rate is 1.90 Guilders per dollar. The required rate of return on repatriated dollar is 16%.

Required:
(i) If the exchange rate stays at 1.90, what is the project NPV?
(ii) If the Guilder appreciates to 1.84 for years 1-3, to 1.78 for years 4-6, 1.72 for years 7-9, and to 1.65 for years 10-19, what happens to NPV?

Year	0	1-3	4-6	7-9	10-19
Discount factors at 16%	1	2.246	1.439	0.922	1.270

(b) Write short notes on any two of the following:
(i) American Depository Receipts (ADRs).
(ii) Commodity swaps.
(iii) Sources of credit rating information. **10+(5+5)=20**

Answer:

6. (a) NPV under Fixed exchange rate ($ 1 = Guilders 1.90):

(Amount in million)

Particulars	Years				
	0	1 - 3	4 - 6	7 - 9	10 - 19
1. Cash flow in Guilders	(26.00)	3.00 p.a	4.00 p.a	5.00 p.a	6.00 p.a
2. Exchange rate (Guilders / $)	1.90	1.90	1.90	1.90	1.90
3. Cash flow in $	(13.6842)	1.5789	2.1053	2.6316	3.1579
4. Discount factor @ 16%	1	2.246	1.439	0.922	1.270
5. Discounted cash flow	(13.6842)	3.5462	3.030	2.4263	4.0105

Net Present Value = **US $ (0.6712) million.**
Recommendation: **Since NPV is negative, the Project should not be accepted.**
NPV under variable exchange rates:

(Amount in million)

Particulars	0	1-3	4-6	7-9	10 -19
Cash flow in Guilders	(26.00)	3.00 p.a	4.00 p.a	5.00 p.a	6.00 p.a
Exchange rate (Guilders / $)	1.90	1.84	1.78	1.72	1.65
Cash flow in $	(13.6842)	1.6304	2.2472	2.9070	3.6364
Discount factor @ 16%	1	2.246	1.439	0.922	1.270
Discounted cash flow	(13.6842)	3.6619	3.2337	2.6803	4.6182

NPV = **US $ 0.5099 Million.**
Recommendation: **Since the NPV is positive, the project may be accepted.**

(b) Short notes:

(i) American Depository Receipts (ADRs): It is a certificate that represents shares of a foreign stock owned and issued by a U.S. Bank. The foreign shares are usually held in custody overseas, but the certificates are traded in the U.S. Through this system, a large number of foreign-based companies are actively traded on one of the three major U.S. equity markets.

Advantages: (i) Access to large capital, (ii) Access to foreign exchange, (iii) No change in the shareholding / voting pattern, (iv) Increased recognition for the company internationally by bankers, customers, etc. (v) No exchange rate risk since the company pays interest and dividends in Indian Rupees.

Limitations: (i) High cost of issue, (ii) Requirement as to large size of issue, (iii) Stringent compliance requirements.

(ii) Commodity Swaps: Commodities are physical assets such as precious metals, base metals, energy stores (such as natural gas or crude oil) and food (including wheat, cattle, etc). Commodity swaps enable producers and consumers to hedge commodity prices. Swaps involving oil prices are probably the most common; however swaps involving weather derivatives are increasingly popular. The floating

leg of a commodity swap is tied to the price of a commodity or a commodity index, while the fixed leg payments are stipulated in the contract as in an interest rate swap. It is common for a commodity swap to be settled in cash, although physical delivery is becoming increasingly common. The floating leg is typically held by a commodity consumer, who is willing to pay a fixed rate for a commodity to guarantee its price. The fixed leg is typically held by a commodity producer who agrees to pay a floating rate which is set by the market price of the underlying commodity, thereby hedging against falls in the price of the commodity. In most cases, swap rates are fixed either by commodity futures or by estimating the commodity forward price.

There are two main types of commodity swaps:

(1) Fixed floating commodity swaps - These are similar to the interest rate fixed-floating swaps except that both legs are commodity based. These are used by commodity producers and consumers to lock in commodity prices.

(2) Commodity for interest swaps: These are similar to equity swaps, in which a total return on the commodity is exchanged for some money market rate [plus or minus a spread].

(iii) Sources of Credit rating Information: The following are the important sources —

1. Trade references: Prospective customer may be required to give 2 or 3 trade references. Thus, the customers may give a list of personal acquaintances or some other existing credit-worthy customers. The Credit manager can send a short questionnaire, seeking relevant information, to the referees.
2. Bank references: Customer requests his banker to provide the required information to the rating agencies.
3. Credit bureau reports: Associations for specific industries may maintain a credit bureau which provides useful and authentic credit information for their members.
4. Past experience: Past experience of dealings with an existing customer also provides requisites information. The transactions should be carefully scrutinized and interpreted in the light of changes in the ensuing period for finding out the credit risk involved.
5. Published Financial Statements: These statements of a customer, read along with its audit report and observations can be examined to determine the credit-worthiness.
6. Reports from point of sale: Credit-worthiness can be evaluated by the reports provided by the consulting salesmen or persons engaged at the point of sale. Such reports are useful as they are first hand reports.
7. Reports from other agencies: Non-Banking Financial Companies (leasing companies, etc) may maintain a defaulting customers/suit-filed cases, etc. CRISIL is one of the entities which maintain detailed list defaulters.

SECTION C
(Answer any one of the following.)

7. (a) (i) Mention four important factors that you would consider for investment decisions in portfolio management.

(ii) An investor is interested to construct a portfolio of securities ALFA and GAMA. He has collected the following information about the proposed investment:

	ALFA	GAMA
Expected return	**20%**	**25%**
σ	**12%**	**16%**

Co-efficient of Correlation (r) between ALFA and GAMA is 0.16.
He wants to constitute only 5 portfolios of ALFA and GAMA as follows:
(1) All funds invested in ALFA.
(2) 50% of funds in ALFA and 50% in GAMA.
(3) 75% of funds in ALFA and 25% in GAMA.
(4) 25% of funds in ALFA and 75% in GAMA.
(5) All funds invested in GAMA.

You are required to calculate:
(A) Expected return under different portfolios.
(B) Risk factor associated with these portfolios.
(C) Which portfolio is best from the view-point of risk?
(D) Which portfolio is best from the view-point of return?

(b) Explain the major risks associated with holding Government securities.

2+(2+4+1+1)+6=16

Answer:

7. (a) (i): Factors are:
(i) Type of securities; (ii) Proportion of investment in fixed interest / dividend securities; (iii) Identification of industry (i.e., which particular industry shows potential of growth; (iv) Selection of company; (v) Objectives of portfolio; (vi) Timing and quantity of purchase of shares; (vii) Risk tolerance (i.e., conservative investors are risk-averse and aggressive investors generally dare to take risk).

(ii): (A) Expected return under different portfolios-
Portfolio (1): 1 x 0.20 + 0 x 0.25 = 20%
Portfolio (2): 0.5 x 0.20 + 0.5 x 0.25 = 22.50%
Portfolio (3): 0.75 x 0.20 + 0.25 x 0.25 = 21.25%
Portfolio (4): 0.25 x 0.20 + 0.75 x 0.25 = 23.75%
Portfolio (5): 0 x 0.20 + 1 x 0.25 = 25%.

(B) Risk factor associated with different Portfolios –
Portfolio (i) = $[(\sigma a^2 \times W_a{}^2) + (\sigma c^2 \times W_c{}^2) + 2\ (\sigma a \times W_a \times \sigma c \times W_c \times \rho ac)]^{1/2}$, where a= ALFA and c = GAMA.
$= [(12^2 \times 1^2) + (16^2 \times 0^2) + 2 \times 12 \times 1 \times 16 \times 0 \times 0.16]^{1/2} = (144)^{1/2} = 12\%$.

Similarly, Portfolio (ii) = $(115.36)^{1/2}$ = 10.74%.
Portfolio (iii) = $(108.52)^{1/2}$ = 10.42%
Portfolio (iv) = $(164.52)^{1/2}$ = 12.83%
Portfolio (v) = $(256)^{1/2}$ = 16%.

(C) The best portfolio from the viewpoint of Risk is one which has least risk factor; i.e., 10.42%, i.e., Portfolio (iii) = **75% fund in ALFA and 25% fund in GAMA.**

(D) The best portfolio from the view-point of Return is one which has best return, i.e., 25%, i.e., Portfolio (v) = **100% fund in GAMA.**

(b) Major risks in holding Govt. securities:

i) Market risk – Market risk arises out of adverse movement of prices of the securities that are held by an investor due to changes in interest rates. This will result in booking losses on marking to market or realizing a loss if the securities are sold at the adverse prices. Small investors, to some extent, can mitigate market risk by

holding the bonds till maturity so that they can realize the yield at which the securities were actually bought.

ii) **Reinvestment risk** – Cash flows on a Government security includes fixed coupon every half year and repayment of principal at maturity. These cash flows need to be reinvested whenever they are paid. Hence there is a risk that the investor may not be able to reinvest these proceeds at profitable rates due to changes in interest rate scenario.

iii) **Liquidity risk** – Liquidity risk refers to the inability of an investor to liquidate (sell) his holdings due to non availability of buyers for the security, i.e., no trading activity in that particular security. Usually, when a liquid bond of fixed maturity is bought, its tenor gets reduced due to time decay. For example, a 10 year security will become 8 year security after 2 years due to which it may become illiquid. Due to illiquidity, the investor may need to sell at adverse prices in case of urgent funds requirement. However, in such cases, eligible investors can participate in market repo and borrow the money against the collateral of the securities.

8. (a) A portfolio manager has the following four stocks in his portfolio:

Security	No. of shares	Market Price per share (₹)	β = Beta
VSL	10,000	50	0.9
CSL	5,000	20	1.0
SML	8,000	25	1.5
APL	2,000	200	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?

(iii) If the Portfolio Manager seeks to increase the Beta to 1.2, how much Risk-Free investment should he bring in?

(b) From the following data, calculate the Return and Risk of a Portfolio containing 60% of Stock A and 40% of Stock B.

Market condition	Probability	$E(R_A)$	$E(R_B)$
Boom	0.25	40%	40%
Growth	0.50	20%	30%
Recession	0.25	10%	20%

10+6=16

Answer:

8. (a)

Security	No. of shares	Market price per share	(1) x (2)	% of total	Beta	Weighted Beta
	(1)	(2)		(W)		
VSL	10,000	50	5,00,000	0.4167	0.9	0.375
CSL	5,000	20	1,00,000	0.0833	1.0	0.083
SML	8,000	25	2,00,000	0.1667	1.5	0.250
APL	2,000	200	4,00,000	0.3333	1.2	0.400
			12,00,000	1.0000		1.108

Hence, Portfolio beta [i] 1.108
[ii] Required beta 0.8
It should become [0.8 / 1.108] 72.2% of the present portfolio
If ₹ 12,00,000 is 72.2%, total portfolio should be -
₹ 12,00,000 x 100 / 72.20 = ₹ 16,62,050
Additional investment in ZERO risk should be (₹ 16,62,050 - ₹ 12,00,000) = ₹ 4,62,050.

(ii) Revised Portfolio will be

Security	No. of shares	Market price per share	(1) x (2)	% to total	Beta	Weighted Beta
	(1)	(2)				
VSL	10,000	50	5,00,000	0.3008	0.9	0.271
CSL	5,000	20	1,00,000	0.0602	1.0	0.060
SML	8,000	25	2,00,000	0.1203	1.5	0.180
APL	2,000	200	4,00,000	0.2407	1.2	0.289
Risk-free Asset	46,205	10	4,62,050	0.2780	0	0
			16,62,050	1		0.800

(iii) To increase Beta to 1.2
Required beta 1.2
It should become 1.2 / 1.108 108.30% of present data
If ₹ 12,00,000 is 108.30%, total portfolio should be 12,00,000 x 100 / 108. 30 = 11,08,030
Additional investment should be (-) 91,967 i.e., Divest ₹ 91,970 of Risk free asset.

Revised portfolio will be -

Security	No. of shares	Market price per share	(1) x (2)	% to total	Beta	Weighted Beta
	(1)	(2)				
VSL	10,000	50	5,00,000	0.4513	0.9	0.406
CSL	5,000	20	1,00,000	0.0903	1.0	0.090
SML	8,000	25	2,00,000	0.1805	1.5	0.271
APL	2,000	200	4,00,000	0.3610	1.2	0.433
Risk-free Asset	(-) 9,197	10	(-) 91,970	(-) 0.0830	0	0
			11,08,030	1		1.20
Portfolio Beta						1.20

(b) Expected return on stock A = (0.25 x 40) + (0.50 x 20) + (0.25 x 10) = 22.5%
Expected return on stock B = (0.25 x 40) + (0.50 x 30) + (0.25 x 20) = 30%
Portfolio return = (0.60 x 22.5%) + (0.40 x 30%) = 25.5%

Variance of Stock A's return:
σ^2_A = [0.25 x (40 – 22.5)^2] + [0.50 x (20 – 22.5)^2] + [0.25 x (10 – 22.5)^2] = 118.75%
σ_A = 10.90%
Variance of stock B's return:
σ^2_B = [0.25 x (40 – 30)^2] + [0.50 x (30 – 30)^2] + [0.25 x (20 – 30)^2] = 50%
σ_B = 7.07%
Cov_{AB} = [(40 – 22.5) × (40 – 30) x 0.25] + [(20 – 22.5) x (30 – 30) x 0.5] + [(10 – 22.5) x (20 – 30) x 0.25] = 75%

$$\rho_{AB} = \frac{Cov_{AB}}{\sigma_A.\sigma_B} = \frac{75}{(10.90)(7.07)} = 0.97$$

And Portfolio Risk = $\sigma^2_\rho = X^2_A \sigma^2_A + X^2_B \sigma^2_B + 2X_A X_B . \sigma_A . \sigma_B . \rho_{AB}$

= [0.60^2 x 118.75] + [0.40^2 x 50] + 2 x 0.60 x 0.40 x 10.90 x 7.07 x 0.97

Hence, $\sigma_\rho = [86.63]^{1/2} = 9.31\%$

SECTION D

(Answer any one of the following.)

9. (a) What do you understand by: Foreign Portfolio Investment? Discuss briefly.

(b) What is Global Financial System? Who are the main players in Global Financial System?

(c) SHREE LEATHERS LTD. has an investment proposal, requiring an outlay of ₹ 40,000. The investment proposal is expected to have 2 years' economic life with no salvage value. In year 1, there is a 0.4 probability that Cash Flow After Tax (CFAT) will be ₹ 25,000 and 0.6 probability that CFAT will be ₹ 30,000.

The probabilities assigned to CFAT for the year 2 are as follows:

If CFAT = ₹ 25,000		If CFAT = ₹ 30,000	
Amount (₹)	**Probability**	**Amount (₹)**	**Probability**
12,000	**0.2**	**20,000**	**0.4**
16,000	**0.3**	**25,000**	**0.5**
22,000	**0.5**	**30,000**	**0.1**

SHREE LEATHERS LTD. uses a 10% discount rate for this type of investment.

Required:

(i) Construct a decision tree for the proposed investment project.

(ii) What Net Present Value (NPV) will the project yield if worst outcome is realised? What is the probability of occurrence of this NPV?

(iii) What will be the best and the probability of that occurrence?

(iv) Will the project be accepted?

[10% discount factor: Year 1 = 0.909 and Year 2 = 0.826] 5+5+10=20

Answer:

9. (a) Foreign Portfolio Investment is the entry of funds into a country where foreigners make purchases in the country's stock and bond markets, sometimes for speculation.

It is usually a short term investment [sometimes less than a year], as opposed to longer term Foreign Direct Investment partnership [possibly through joint venture], involving transfer of technology and 'know-how'. For example, Ford Motor Company may invest in a manufacturing plant in Mexico, yet not be in direct control of its affairs. Foreign Portfolio Investment is passive holdings of securities and other financial assets, which do not entail active management of risk through geographic diversification. The return on FPI is normally in the form of interest payments or non-voting dividends. It is important to mention that there are regulations regarding portfolio investments by NRIs / PIOs.

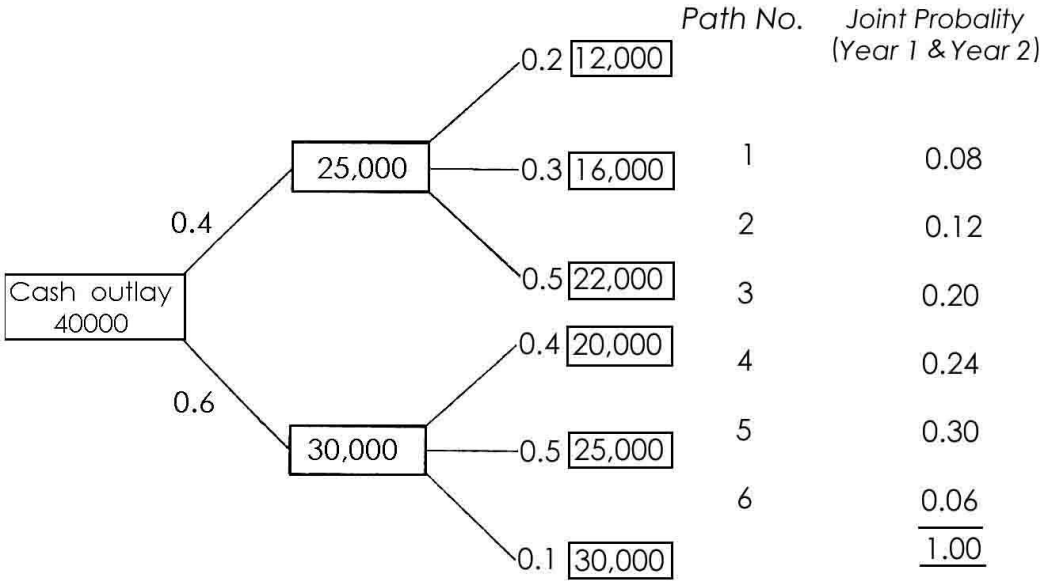
(b) Global Financial System: This consists of institutions, their customers, and financial regulators that act on a global level.

The term 'global' is often used synonymously with the terms 'international' or 'multinational'. Economists do not have a standard definition for a global versus multinational company.

The main players are:

1. Global or international systematically important financial institutions, e.g., banks, hedge funds whose failure may cause a global crisis, the International Monetary Fund and the Bank for International Settlements.
2. Customers of the global financial system, which include multinational corporations, as well as countries, with their economies and government entities, e.g., the Central banks of the G 20 major economies, finance ministers EU, NAFTA, OPEC, and others, etc.
3. Regulators of the global financial system, many of which play dual roles, in that they are financial organizations at the same time. These include the above mentioned International Monetary Fund and Bank for International Settlements, particularly its "Global Economy Meeting (GEM) in which all systematic emerging economies' Central bank governors are fully participating, has become the prime group for global governance among central banks" per Jean-Claude Trichet, President of the European Central Bank, as well as the financial regulators of the USA (the US agency of quintet of Federal Reserve, Office of Comptroller of the Currency, Federal Deposit Insurance Corporation, Commodity Futures' Trading Commission, Federal Reserve Board, Securities and Exchange Commission, Europe (European Central Bank) and the Bank of China, besides others.

(c) i. Decision Tree:



The decision tree shows that there are six possible outcomes each represented by a path.

Net present value at 10% discount rate is as under:

(Amount in ₹)

Path	Cash inflow yr 1 x Discount factor [0.909] [a]	Cash inflow yr.2 x Discount factor [0.826] [b]	Total cash Inflow [c] = [a] + [b]	Cash Outflow [d]	Net present value [e] = [c] – [d]
1.	25,000 x 0.909 = 22,725	12,000 x 0.826 = 9,912	32,637	40,000	(-) 7,363
2.	25,000 x 0.909 = 22,725	16,000 x 0.826 = 13,216	35,941	40,000	(-) 4,059
3.	25,000 x 0.909	22,000 x 0.826	40,897	40,000	897

	= 22,725	= 18,172			
4.	30,000 x 0.909 = 27,270	20,000 x 0.826 = 16,520	43,790	40,000	3,790
5.	30,000 x 0.909 = 27,270	25,000 x 0.826 = 20,650	47,920	40,000	7,920
6.	30,000 x 0.909 = 27,270	30,000 x 0.826 = 24,780	52,050	40,000	12,050

ii. If the worst outcome is realized, NPV which the project will yield is ₹ 7,363 (negative). The probability of occurrence of this NPV is 8%

iii. The best outcome will be path 6 when NPV is highest i.e., ₹12,050 (positive). The probability of occurrence of this NPV is 6%

Statement showing the Expected NPV: (Amount in ₹)

Path	NPV @ 10%	Joint probability	Expected PV
1	(-) 7,363	0.08	(-) 589.04
2	(-) 4,059	0.12	(-) 487.08
3	897	0.20	179.40
4	3,790	0.24	909.60
5	7,920	0.30	2,376.00
6	12,050	0.06	723.00
		1.00	3,111.88

iv. Yes, the project will be accepted since Expected NPV is POSITIVE.

10. (a) What is Cross Border Leasing? What are its objectives?

(b) M/s JAMUNALAL BAJAJ LTD. is considering a project with the following cash flows:

Initial investment	**₹ 1,00,000**
Expected Cash flows:	
1st year	**₹ 70,000**
2nd year	**₹ 60,000**
3rd year	**₹ 45,000**

The cost of capital is 10%.
Due to uncertainty of future cash flows, the management decides to reduce the cash inflows to certainty equivalent by taking only 80%, 70% and 60% respectively.
Is it worthwhile to take up the project?
[Given: P.V. factor (10%, 3 years): 0.909, 0.826 and 0.751]

(c) Nava Ratna Ltd. has just installed MACHINE R at a cost of ₹ 2,00,000. This machine has 5 years life with no residual value. The annual volume of production is estimated at 1,50,000 units, which can be sold at ₹ 6 per unit. Annual operating costs are estimated at ₹ 2,00,000 (excluding depreciation) at this output level. Fixed costs are estimated at ₹ 3 per unit for the same level of production.

The company has just come across another model called MACHINE S, capable of giving the same output at an annual operating costs of ₹1,80,000 (excluding depreciation). There will be no change in fixed costs. Capital cost of this machine is ₹ 2,50,000 and the estimated life is 5 years with no residual value.

The company has an offer for sale of MACHINE R at ₹ 1,00,000. But the cost of dismantling and removal will amount to ₹ 30,000. As the company has not yet commenced operation, it wants to sell MACHINE R and purchase MACHINE S.

Nava Ratna Ltd. will be a zero-tax company for 7 years in view of several incentives and allowances available. The cost of capital may be assumed as 14%.

Required:

(i) Advise the company whether it should opt for replacement.

(ii) What would be your advice, if MACHINE R has not been installed but the company is in the process of selecting one or the other machine?

[Given: PVIF for 1-5 years = 0.877, 0.769, 0.675, 0.592, 0.519] 5+5+10=20

Answer:

10. (a) Cross Border Leasing is a leasing arrangement where lessor and lessee are situated in different countries. It can be considered as alternative to equipment loans to foreign buyers, the only difference being the documentation, with down payments, payment streams, and lease-end options the same as offered under Equipment loans. Operating leases may be feasible for exports of large equipment with a long economic life relative to the lease term.

Objectives:

(i) Overall cost of financing - The overall cost of financing can be reduced through utilization by the lessor of tax depreciation allowances to reduce its taxable income. The tax saving are passed through to the lessee as a lower cost of finance.

(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 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 utilize very favourable "Leveraged Lease" financial accounting treatment for the overall transaction.

(iv) Re-possession: In some countries, it is easier for a lessor to re-possess the leased equipment following a lease default because the lessor is an owner and not a mere secured lender.

(b) Computation of Certainty Equivalents of Cash inflows:

1st. Year 70,000 x 80 / 100 = ₹ 56,000.
2nd. Year 60,000 x 70 / 100 = ₹ 42,000.
3rd. Year 45,000x60/100 = ₹ 27,000.

Computation of Risk - adjusted NPV of the project:

Year	Cash flow (₹)	P. V. Factor (10%)	P. V. (₹)
0	(1,00,000)	1.000	(1,00,000)
1	56,000	0.909	50,904
2	42,000	0.826	34,692
3	27,000	0.751	20,277
		NPV =	5,873

Decision : NPV of the Project is Positive and, therefore, the project can be selected.

(C) Replacement of Machine R:

Incremental cash outflow:

Cash outflow of Machine S	₹ 2,50,000
Less: Sale value of Machine R (₹ 1,00,000 - 30,000)	₹ 70,000
Net outflow	₹ 1,80,000

Incremental cash flow from Machine S:

Annual cash flow from Machine S:
[(1,50,000 x 6) – 1,80,000 - (1,50,000 x 3)] ₹ 2,70,000
Annual cash flow from Machine R:
[(1,50,000 x 6) - 2.00.000 - (1,50,000 x 3)] ₹ 2,50,000
Net inflow ₹ 20,000
Present value of Incremental cash inflow:
= 20,000 x (0.877 + 0.769 + 0.675 + 0.592 + 0.519) = ₹ 68,640
NPV of Machine S = 68,640 - 1,80,000 = ₹ (-) 1,11,360.
[₹ 2,00,000 spent on Machine R is a sunk cost and hence it is not relevant for deciding the replacement]

Decision: NPV of Machine S is NEGATIVE. Replacement is not advised. If it selects one of the two, independent NPV is to be calculated for this decision.

Independent evaluation of Machine R & Machine S:

[All in ₹]

Particulars	**Machine R**	**Machine S**
Units produced	1,50,000	1,50,000
Selling Price @ ₹ 6	9,00,000	9,00,000
Less: Operating cost (Exclusive of depreciation)	2,00,000	1,80,000
Contribution	7,00,000	7,20,000
Less: Fixed cost	4,50,000	4,50,000
Annual cash flow	2,50,000	2,70,000
PV of cash flows for 5 years, i.e.,[Sum of PVIF for 14%, 5]		
3.432 x 2,50,000	8,58,000	
3.432 x 2,70,000		9,26,640
Cash out flow	2,00,000	2,50,000
NPV	6,58,000	6,76,640

Decision: Choose Machine S as NPV of S is higher than that of R.