Paper 14: Advanced Financial Management (AFM)
Section – A

1. Explain the steps taken by SEBI for the Development of Capital Market in India.

Answer:

To introduce improved practices and greater transparency in the capital markets and for capital market development, the roles of SEBI are:

1. SEBI has drawn up a programme for inspecting stock exchanges. Under this programme, inspections of some stock exchanges have already been carried out. The basic objective of such inspections is to improve the functioning of stock exchanges.
2. SEBI has been authorised to conduct inspections of various mutual funds. In this respect, it has already undertaken inspection of some mutual funds. Various deficiencies of the individual mutual funds have been pointed out in the inspection reports and corrective steps undertaken to rectify these deficiencies.
3. SEBI has introduced a number of measures to reform the primary market in order to make stronger the standards of disclosure. SEBI has introduced certain procedural norms for the issuers and intermediaries, and removed the inadequacies and systemic deficiencies in the issue procedures.
4. The process of registration of intermediaries such as stockbrokers has been provided under the provisions of the Securities and Exchange Board of India Act, 1992.
5. In order to encourage companies to exercise greater care for timely actions in matters relating to the public issue of capital. SEBI has advised the stock exchanges to collect from companies making public issues, a deposit of 1 % of the issue amount which could be forfeited in case of non-compliance with the provisions of the listing agreement and non-despatch of refund orders and share certificates by registered post within the prescribed time.
6. Through an order under the Securities Contracts (Regulations) Act 1956, SEBI has directed the stock exchanges to broad base their governing boards and change the composition of their arbitration, default and disciplinary committees. The broad basing of the governing boards of the stock exchanges would help them function with greater degree of autonomy and independence or that they become truly self-regulatory organizations.
7. Merchant banking has been statutorily brought under the regulatory framework of SEBI. The merchant bankers have to be authorised by SEBI. They will have to hold to specific capital adequacy norms and bear by a code of conduct, which specifies a high degree of responsibility towards inspectors in respect of the pricing and premium fixation of issues.
8. SEBI issued regulations pertaining to "Insider Trading" in November 1992 prohibiting dealings, communication in matters relating to insider trading. Such regulations will help in protecting the market's integrity, and in the long run inspire investor confidence in the market.
9. SEBI issued a separate set of guidelines for development financial institutions in September 1992 for disclosure and investment protection regarding their raising of funds from the market. As per the guidelines, there is no need for promoter's contribution. Besides, underwriting is not mandatory.
10. SEBI has notified the regulations for mutual funds. For the first time mutual fund's are governed by a uniform set of regulations which require them to be formed as trusts

and managed by a separate Asset Management Company (AMC) and supervised by a board of trustees. SEBI (Mutual fund) regulations provide for laissez-faire relationship between the various constituents of the mutual funds and thus bring about a structural change which will ensure qualitative improvement in the functioning of the mutual funds and require that the AMCs have a minimum net worth of Rs. 6 crores of which the sponsors must contribute at least 40 percent. The SEBS (Mutual Fund) Regulations also provide for an approval of the offer documents of schemes by SEBI. The regulations are intended to ensure that the mutual funds grow on healthy lines and investors' interest is protected.

11. To bring about greater transparency in transactions, SEBI has made it mandatory for brokers to maintain separate accounts for their clients and for themselves. They must disclose the transaction price and brokerage separately in the contract notes issued to their clients. They must also have their books audited and audit reports filed with SEBI.
12. SEBI has issued directives to the stock exchanges to ensure that contract notes are issued by brokers to clients within 24 hours of the execution of the contract. Exchanges are to see that time limits for payment of sale proceeds and deliveries by brokers and payment of margins by clients to brokers are complied with.
13. In August 1994, guidelines were issued in respect of preferential issues for orderly development of the securities market and to protect the interest of investors.
14. The 'Banker to the issue' has been brought under purview of SEBI for investor protection. Unit Trust of India (UTI) has also been brought under the regulatory jurisdiction of SEBI.
15. In July 1995, the Committee set up by SEBI under the chairmanship of Y. H. Malegam to look into the disclosure of norms for public issues, recommended stricter regulations to control irregularities affecting the primary market. Following the recommendations of the Malegam Committee, SEBI issued a number of guidelines in September and October 1995 to protect the interest of investors.
16. A series of measures to control the prices and to check other malpractices on the stock exchanges were announced by SEBI on December 21, 1995
17. Guidelines for reduction the entry norms for companies accessing capital market were issued by SEBI on April 16, 1996.

The above discussion shows that SEBI has undertaken a number of steps to establish a fair, transparent and a strong regulatory structure for the efficient functioning of the capital market and for protecting the interest of the investors. These steps have helped in developing the capital market on healthy lines.

2. Define Non-Banking Financial Company (NBFC). What are the differences between banks & NBFCs. Point out the main problems in the working of State Cooperative Banks?

Answer:

Non-Banking Financial Company

A Non-Banking Financial Company (NBFC) is a company registered under the Companies Act, 1956 engaged in the business of loans and advances, acquisition of shares/stocks/bonds/debentures/securities issued by Government or local authority or other marketable securities of a like nature, leasing, hire-purchase, insurance business, chit business but does not include any institution whose principal business is that of agriculture activity, industrial activity, purchase or sale of any goods (other than securities) or providing any services and sale/purchase/construction of immovable property. A non-banking institution which is a

company and has principal business of receiving deposits under any scheme or arrangement in one lump sum or in instalments by way of contributions or in any other manner, is also a non-banking financial company (Residuary non-banking company).

Difference between banks & NBFCs

NBFCs lend and make investments and hence their activities are akin to that of banks; however there are a few differences as given below:

(i) NBFC cannot accept demand deposits;

(ii) NBFCs do not form part of the payment and settlement system and cannot issue cheques drawn on itself;

(iii) Deposit insurance facility of Deposit Insurance and Credit Guarantee Corporation is not available to depositors of NBFCs, unlike in case of banks

Problems in the working of State Cooperative Banks:-

i) Poor deposits mobilisation: These banks have not been successful in raising deposits as, even now, individual deposits from less than 25 per cent in many States.

ii) Undesirable investment of funds: These banks are not followed the guide of RBI about the matter of investment of fund. Despite the advice of the RBI, a cautious policy is not being followed in the matter of investment of the funds which agriculture even now utilised for the purchase of shares in other cooperative institutions; or in making huge advances to the primary cooperative societies; and by way of loans to individuals.

iii) Failure to assess genuineness of borrowing: The banks have failed in assessing the genuineness of the borrowings of the Central Cooperative Banks. This is evidenced from the fact that the credit limits of such banks had been fixed on the basis of their owned funds without taking into account their past performance; and the bank's own financial position.

iv) Ineffective supervision and inspection: Many of the Banks have not taken up this work in right way. Some of the banks have neither adequate nor separate staff for this work. Officers of these banks sometimes pay only ad-hoc and hurried visits.

v) Book adjustment: Book adjustments are often made regarding repayment of loans. The State Cooperative Banks have failed to check the fictitious transactions of the Central cooperative Banks.

vi) Increasing over dues: The over dues of the Banks have been showing a rising trend. This is due to the fact that these banks have not followed the prescribed loaning procedure.

vii) They utilise their reserve funds as working capital.

3. Write Short Notes

a. Pension System in India

b. No Ombudsman for hearing complaints against NBFCs

c. Certificate of Deposits

d. Repo and Reverse Repo

e. Objectives of Commodity Futures.

f. Key reasons to invest in infrastructure in India

Answer:

a. Pension System in India:

In India, the pension system coverage is very small at present. The pension market in India is highly unorganised which covers hardly three per cent of the Indian population. The Employees' Provident Fund (EPF), Employees' Pension Scheme (EPS), and the PPF are the only schemes, which cover the pension market in India. The regular salaried employees in the organised sector have been relatively better off in that public policy provided vehicles for compulsory savings and old age provisions. It is estimated that by the year 2000, around 23 per cent of people employed in the government sector were the beneficiaries of the government's 'defined benefit pension scheme', and 49 per cent of people employed in the private sector were covered by the mandatory employee provident fund.

Last seven years, from 2000 to 2007, have seen a marked shift in pension policy in India through introduction of a new pension system. OASIS committee has recommended two major pension reforms for the government employees and the unorganised sector respectively. These efforts culminated in setting up of the Pension Fund Regulatory and Development Authority (October 2003). Introduction of a new pension system (December 2003), and introduction of the PFRDA Bill in Parliament (March 2005).

Pension Fund Regulatory and Development Authority (PFRDA) was established by the Government of India on August 23, 2003. to promote old age income security by establishing, developing and regulating pension funds, to protect the interests of subscribers to schemes of pension funds and for matters connected therewith or incidental thereto. The authority shall consist of a Chairperson and not more than five members, of whom at least three shall be whole-time members, to be appointed by the Central Government.

The pension schemes in operation in India currently can broadly be divided into the following categories: (1) Civil Services Pension Schemes (Pay as- you-go), (2) Employees' Provident Fund (EPF), (3) Employees' Pension Scheme (EPS). (4) New Pension Scheme (NPS), (5) Voluntary Pension Schemes under which two schemes are in operation such as (i) Personal / Group Pension Plans, (ii) Public Provident Fund.

b. No Ombudsman for hearing complaints against NBFCs

There is no Ombudsman for hearing complaints against NBFCs. However, in respect of credit card operations of an NBFC, if a complainant does not get satisfactory response from the NBFC within a maximum period of thirty (30) days from the date of lodging the complaint, the customer will have the option to approach the Office of the concerned Banking Ombudsman for redressal of his grievance/s.

All NBFCs have in place a Grievance Redressal Officer, whose name and contact details have to be mandatorily displayed in the premises of the NBFCs. The grievance can be taken up with the Grievance Redressal Officer. In case the complainant is not satisfied with the settlement of the complaint by the Grievance Redressal Officer of the NBFC, he/she may approach the nearest office of the Reserve Bank of India with the complaint. The detail of the Office of the Reserve Bank has also to be mandatorily displayed in the premises of the NBFC.

c. Certificate of Deposits

Certificates of Deposit (CDs) - introduced since June 1989 - are unsecured, negotiable, short-term instruments in bearer form, issued by a commercial bank(s)/Financial Institution(s) at discount to face value at market rates, with maturity ranging from 15 days to one year.

Being securities in the form of promissory notes, transfer of title is easy, by endorsement and delivery. Further, they are governed by the Negotiable Instruments Act. As these certificates are the liabilities of commercial banks/financial institutions, they make sound investments.

DFHI trades in these instruments in the secondary market. The market for these instruments is not very deep, but quite often CDs are available in the secondary market. DFHI is always willing to buy these instruments thereby lending liquidity to the market.

CD is a negotiable money market instrument and issued in dematerialized form or as a Usance Promissory Note, for funds deposited at a Bank or other eligible Financial Institution for a specified time period.

d. Repo and Reverse Repo

Repo or ready forward contact is an instrument for borrowing funds by selling securities with an agreement to repurchase the said securities on a mutually agreed future date at an agreed price which includes interest for the funds borrowed. Repo rate is the return earned on a repo transaction expressed as an annual interest rate.

The reverse of the repo transaction is called 'reverse repo' which is lending of funds against buying of securities with an agreement to resell the said securities on a mutually agreed future date at an agreed price which includes interest for the funds lent.

It can be seen from the definition above that there are two legs to the same transaction in a repo/ reverse repo. The duration between the two legs is called the 'repo period'. Predominantly, repos are undertaken on overnight basis, i.e., for one day period. Settlement of repo transactions happens along with the outright trades in government securities.

The consideration amount in the first leg of the repo transactions is the amount borrowed by the seller of the security. On this, interest at the agreed 'repo rate' is calculated and paid along with the consideration amount of the second leg of the transaction when the borrower buys back the security. The overall effect of the repo transaction would be borrowing of funds backed by the collateral of Government securities.

The money market is regulated by the Reserve Bank of India. All the above mentioned money market transactions should be reported on the electronic platform called the Negotiated Dealing System (NDS).

As part of the measures to develop the corporate debt market, RBI has permitted select entities (scheduled commercial banks excluding RRBs and LABs, PDs, all-India FIs, NBFCs, mutual funds, housing finance companies, insurance companies) to undertake repo in corporate debt securities. This is similar to repo in Government securities except that corporate debt securities are used as collateral for borrowing funds. Only listed corporate debt securities that are rated 'AA' or above by the rating agencies are eligible to be used for repo. Commercial papers, certificate of deposit, non-convertible debentures of original maturity less than one year are not eligible for the purpose. These transactions take place in the OTC market and are required to be reported on FIMMDA platform within 15 minutes of the trade for dissemination of information. They are also to be reported on the clearing house of any of the exchanges for the purpose of clearing and settlement.

e. Objectives of Commodity Futures.

- Hedging with the objective of transferring risk related to the possession of physical assets through any adverse moments in price. Liquidity and Price discovery to ensure base minimum volume in trading of a commodity through market information and demand supply factors that facilitates a regular and authentic price discovery mechanism.
- Maintaining buffer stock and better allocation of resources as it augments reduction in inventory requirement and thus the exposure to risks related with price fluctuation declines. Resources can thus be diversified for investments.

- Price stabilization along with balancing demand and supply position. Futures trading leads to predictability in assessing the domestic prices, which maintains stability, thus safeguarding against any short term adverse price movements. Liquidity in Contracts of the commodities traded also ensures in maintaining the equilibrium between demand and supply.
- Flexibility, certainty and transparency in purchasing commodities facilitate bank financing. Predictability in prices of commodity would lead to stability, which in turn would eliminate the risks associated with running the business of trading commodities. This would make funding easier and less stringent for banks to commodity market players.

f. Key reasons to invest in infrastructure in India

(i) **Infrastructure: Major growth driver:** The booming Indian economy combined with the high population growth rate is creating tremendous pressure to modernize, sustain and accelerate investment in country's infrastructure. This has become more prominent over the past few decades since the investment backlog has exceeded billions.

(ii) **Private Capital Requirements**: The basis of economic activity is infrastructure. India could have grown faster had the investments in infrastructure been commiserate with economic activity. Construction activity has a direct impact on output and all economic sectors benefit from comprehensive infrastructure.

(iii) **Immense Regional Disparities:** Inter-state disparity in per capita income among Indian states has been rising over the last couple of decades. In addition, the inter-state disparities in economic and social infrastructure facilities too have remained at alarmingly high levels. Hence, investment in infrastructure is required in order to boost inter-state level of development.

(iv) **Managing Institutional Risks:** The big infrastructure opportunities are not without inherent risks like macroeconomic risks associated with emerging markets like India, low degree of liquidity in markets and unsatisfactory transparency of market players and the market itself. Therefore, these risks need to be managed competently for Indian infrastructure to flourish

4.

a) What are the factors affecting fluctuation of call rate? Point out the measures adopted from time to time for stabilizing call rates?

b) The following are the data on Five mutual funds-

Fund	Return	Standard Deviation	Beta
Laheri	15	7	1.25
Mitra	1 8	10	0.75
Vredhi	14	5	1.40
Varsha	12	6	0.98
Raksha	16	9	1.50

What is the reward – to – variability ratio and the ranking if the risk – free rate is 6%?

Answer:

a) After the removal of ceiling, the call rate has fluctuated widely. The call rate is volatile due to following reasons:

i) Large borrowings on certain dates by banks to meet the CRR requirements (then call rate rise sharply) and demand for call money falls when CRR needs are met.

ii) The credit operations of certain banks tend to be much in excess of their own resources.

iii) Disturbance in the banking industry.

iv) When liquid fund of an institution is very essential to repay the loan, advance tax, matured amount of security, and at the boom position of institution the call rates increase.

v) When call market is easy, Banks invest funds in govt. securities, bonds in order to maximise earnings. But with no buyers in the market, these securities are not cashed. Due to such liquidity crisis, call rate is high.

vi) The structural deficiencies in the banking system. The banking system tries to build up deposits in last week of end of the year.

vii) Forex market turbulence.

viii) Call market is over-the-telephone-market. Borrowers and lenders contact each other over telephone. In the absence of perfect communication they deal at different rates.

ix) In call market, main borrowers are commercial banks and lenders are UTI, LIC etc. In absence of lenders for few days, call rates rise up.

x) When Govt. securities mature and are encashed by the public, supply of call loans increases and call rates fall.

xi) Cyclical mass import payments reduce liquidity in the money market and hence call rates decreases.

Measures adopted from time to time for stabilizing call rates:

The volatility of call rate can be controlled to achieve a state of stability by the following ways:

(i) Intervention by the DFHI as market maker.

(ii) Channelization of more funds by the RBI through the DFHI, & STCI.

(iii) Channelization of more funds by certain financial institutions with surplus funds.

(v) Introduction of new money market instruments and allowing large number of participants in call money market.

(vi) Use of call loans for normal banking operation.

For this purpose, the RBI has been established different policy. The money market support by RBI and the reduction in CRR for credit expansion & for increase liquidity, and increasing Govt. securities refinancing had helped to moderate the call rate in 1995. The spot foreign exchange purchases by the RBI had helped to reduce the call rate in March 1996. The recommencement of repo auctions by RBI in November 1996 had provided a reasonable floor to call money rates.

It cannot be said that these measures have reduced the volatility in the call market in India.

Inter – Bank Money and its distinction from Call Money and Notice Money:

Inter Bank Market for deposits of maturity beyond 14 days is referred to as Inter-Bank Term Money. Term Money is accepted by the institutions at a discounted value, and on the due date payment will be made equal to the face value.

b) Formula for computing Reward – to – Volatility / Volatility Ratio is –

- Treynor's Ratio = $[(R_p - R_f) \div \beta_p]$
- Sharpe's Measure = $[(R_p - R_f) \div \sigma_p]$

Ranking based on Sharpe's Ratio and Treynor Method:

Portfolio	Under Sharpe's Method $[(R_p - R_f) \div \sigma_p]$	Ranking	Under Treynor Method $[(R_p - R_f) \div \beta_p]$	Ranking
Laheri	[(15 - 6) ÷ 7] = 1.29	2	[(15 - 6) ÷ 1.25] = 7.20	2
Mitra	[(18 - 6) ÷ 10] = 1.20	4	[(18 - 6) ÷ 0.75] = 16.00	1
Vredhi	[(14 - 6) ÷ 5] = 1.60	1	[(14 - 6) ÷ 1.40] = 5.71	5
Varsha	[(12 - 6) ÷ 6] = 1.00	5	[(12 - 6) ÷ 0.98] = 6.12	4
Raksha	[(16 - 6) ÷ 8] = 1.25	3	[(16 - 6) ÷ 1.50] = 6.67	3

5. What do you mean by Commercial Paper? Explain the silent features of commercial paper. What are the reasons for under developed bill market in India?

Answer:

Commercial paper (CP) is an unsecured short-term promissory note, negotiable and transferable by endorsement and delivery with a fixed maturity period. It is issued only by large, well known, creditworthy companies and is typically unsecured, issued at a discount on face value, and redeemable at its face value. The aim of its issuance is to provide liquidity or finance company's investments, e.g. in inventory and accounts receivable.

The major issuers of commercial papers are financial institutions, such as finance companies, bank holding companies, and insurance companies. Financial companies tend to use CPs as a regular source of finance. Non-financial companies tend to issue CPs on an irregular basis to meet special financing needs.

Commercial paper was introduced in 1990 to enable highly rated investors to diversify their sources, of their short-term borrowings and also to produce and additional instrument in the market. Guidelines issued by RBI are applicable to issuers if CP likes Non-banking finance companies and non- financial companies. Primary dealers are also permitted to issue commercial paper. CP should be issued for a minimum period of 7 days to a maximum period of one year. No grace period is allowed for payment and if the maturity date falls on a holiday it should be paid on the previous working day. Commercial paper can be permitted to be issued by the companies whose net worth is not less than ₹5 crore. And fund based working capital limits are not less than ₹4 crore. It must be a listed company on a stock exchange and should have given credit rating by CRISIL.

The difference between the initial investment and the maturity value constitutes the income of the investor.

e.g. A Company issues a Commercial Paper each having maturity value of ₹5,00,000. The Investor pays (say) ₹4,82,850 at the time of his investment. On maturity, the Company pays ₹5,00,000 (maturity value or redemption value) to the Investor. The Commercial Paper is said to be issued at a discount of ₹5,00,000 - ₹4,82,850 = ₹17,150. This constitutes the interest income of the investor.

Salient Features of Commercial Paper-

- CPs are issued by companies in the form of usance promissory note, redeemable at par to the holder on maturity.
- The tangible net worth of the issuing company should be not less than ₹4 crores.
- Working capital (fund based) limit of the company should not be less than ₹4 crores.

- Credit rating should be at least equivalent of P-2 of CRISIL/P2/PP2/D2 or higher from any approved rating agencies and should be more than 2 months old on the date of issue of CP.
- Corporates are allowed to issue CP up to 100% of their fund based working capital limits.
- It is issued at a discount to face value.
- CP attracts stamp duty.
- CP can be issued for maturities between 15 days and less than one year from the date of issue.
- CP may be issued in the multiples of ₹5 lakh.
- No prior approval of RBI is needed to issue CP and underwriting the issue is not mandatory.
- All expenses (such as dealers' fees, rating agency fee and charges for provision of stand-by facilities) for issue of CP are to be borne by the issuing company.

6. Ascertain the Time Weighted Rate of Return and annual Compounded Rupee Weighted Rate of return from the following information given relating to Subham Fund.

- **Fund value at the beginning is ₹ 6 Crores.**
- **3 months hence, the value had increased by 15% of the opening value.**
- **3 months hence, the value had increase by 12% of the value three months before. At that time there was an outflow of ₹ 1 Crore by way of dividends.**
- **3 months hence, the value had decreased by 10% of the value three months before.**
- **During the last three months of the year, value of the fund had increased by ₹ 1 Crores.**

Answer:

1. Computation of Closing Value (as at the yearend)

Time	Opening Value	Additions / Appreciation	Distributions / Depreciation	Closing Value
Months 1-3	6.0000	[6.00 × 15 %] = 0.9000	-	6.9000
Months 4-6	6.9000	[6.90 × 12 %] = 0.8280	1.0000	6.7280
Months 7-9	6.7280	-	[6.7280 × 10 %] = 0.6728	6.0552
Months 10-12	6.0552	1.0000	-	**552.552**

2. Time Weighted Rate Return:

a) Computation of Closing Value ignoring cash flows in between

Particulars			₹ Crores
Add:	Opening Investment		**6.0000**
	Value Appreciation for first three months	[₹ 6 Crores ×15%]	0.9000
Add:	Value at the end of 3rd month		6.9000
	Appreciation for Months 4 to 6	[₹ 6.9 Crores ×12%]	0.8280
Less:	Value at the end of 6th months		7.7280
	Depreciation for Months 7 to 9	[₹ 7.728 Crores	(0.7728)

		×10%]	
Add:	Value at the end of 9th month Appreciation for Months 10 to 12		6.9552 1.0000
Value at the end of the year			**7.9552**

b) Computation of Return
Return in Value = Value at the end of the year – Value at the beginning of the year
= ₹ 7.9552 Crores - ₹ 6 Crores = ₹ 1.9552 Crores
Return in % (Annual Compounding)
= Return in Value ÷ Value at the beginning of the year
= ₹ 1.9552 Crores ÷ ₹ 6 Crores = 32.59% (Annual Compoundind)
Return in % (Quarterly Compounding) =
Product of each quarter's Closing value (before dividend) ÷ Opening Value for the Quarter) – 1

$$= \frac{6.9000}{6.0000} \times \frac{7.7280}{6.0000} \times \frac{6.0552}{6.7280} \times \frac{7.0552}{6.0552} - 1 = 1.3506 - 1 = 0.3506 \text{ or } 35.06\%$$

3. Rupee Weighted Rate Return:
(Measured from the Investor's Perspective)
It is the rate at which the Net Present Value of Cash Flow will be equal to zero i.e. Internal Rate of Return presuming that the investor will receive equivalent to the closing value.

a. Computation of Return in %
Return (Value) = Dividend + Capital Appreciation
= ₹ 1 Crore + [Closing Value of ₹ 7.0552 Crores **Less** Opening Value of ₹ 6 Crores]
= ₹ 1 Crore + ₹ 1.0552 Crores = 2.0552 Crores
Return in % = Return in Value ÷ Opening Value = ₹ 2.0552 Crores ÷ ₹ 6 Crores = **34.253 %** Average Quarterly Discount Rate = 34.253 ÷ 4 = 8.56%

b. Computation of Net Present Value
Note: Since cash flows occur on a quarterly basis, Present Value factor is based on quarterly discount rate. The First Discount Rate Chosen 9 % (average quarterly discount rate rounded off to nearest %).

Time Period (Quarters)	Nature	Cash Flow	Discount Factor @9%	Discounted Cash Flow	Discount Factor @ 8%	Discounted Cash Flow
0	Investment (Opening NAV)	(6.000)	1.000	(6.000)	1.000	(6.000)
1	-	-	0.917	-	0.926	-
2	Dividend Distribution	1.000	0.842	0.842	0.857	0.857
3	-	-	0.772	-	0.794	-
4	Closing NAV	7.0552	0.708	4.993	0.735	5.186
				(0.165)		0.043

Since the NPV using Rate 1 is negative, Rate 2 should be lower than Rate 1 to get a positive NPV.

c. Computation of Internal Rate of Return

Computation of Rupee Weighted Rate of Return (RWRR) = Internal Rate of Return:
Internal Rate of Return [IRR]

$$= R_2 - \frac{[V_2 - V_M]}{[V_2 - V_1]} \times [R_1 - R_2]$$

$$= 8\% + \frac{[0.043 - V_M]}{[0.043 - (-0.165)]} \times [9\% - 8\%]$$

= 8% + [0.043/0.208] × 1% = 8.207 %
= 8.207 % per quarter
Therefore, RWRR per quarter is 8.207 % or 32.828 % p.a.

d. Rupee Weighted Rate of Return
Risk Weighted Rate of Return = Internal Rate of Return = 32.828 %

7. What makes commodity trading attractive? Write the characteristics of commodity Exchange in India? Mention the powers of Forward market commission?

Answer:

- A good low-risk portfolio diversifier
- A highly liquid asset class, acting as a counterweight to stocks, bonds and real estate.
- Less volatile, compared with, equities and bonds.
- Investors can leverage their investments and multiply potential earnings.
- Better risk-adjusted returns.
- A good hedge against any downturn in equities or bonds as there is
- Little correlation with equity and bond markets.
- High co-relation with changes in inflation.
- No securities transaction tax levied.

Characteristics of commodity Exchange in India:

- There is no value-adding process performed on commodity items. A unit of one type of commodity is broadly interchangeable with another unit. This allows the units to be traded on exchanges without prior inspection.
- Commodities are produced "naturally" which means that each commodity is subject to unique supply factors. For example, the production of coffee is affected by the weather, while that of copper is affected by availability of ore. The supply of oil is subject to a great deal of disruptions including wars, geopolitical uncertainty, accidents, or transport issues.
- Commodities are subject to cycles in demand from both intermediate players and end users. High prices usually lead to a boost in resource investments causing excess supply in the future which eventually pushes down commodity prices.
- Commodities from different groups can often exhibit negative correlation at any point of time. For example, the prices of wheat and aluminum can move in the opposite direction as they are affected by a different set of factors.
- Commodity prices are positively correlated with growth measures, although there may be a significant lag between a pickup in industrial production and commodity prices.

- Commodities generally exhibit positive correlation with inflation indicators. In particular, commodities tend to react to an early stage of inflation as raw material price appreciation generally tends to precede, and quite often exceed consumer price inflation growth. While true over the very long term, the relationship between inflation and commodity prices has been considerably weaker over the last 10 years, which has been characterized by disinflation/low inflation.

The above characteristics may not be true for all commodities taken individually; however they are true for diversified indices of industrial commodities and agricultural commodities.

Mention the powers of Forward market commission

(1) The Commission shall, in the performance of its functions, have all the powers of a civil court under the Code of Civil Procedure, 1908 (5 of 1908), while trying a suit in respect of the following matters, namely:

(a) Summoning and enforcing the attendance of any person and examining him on oath. 8

(b) Requiring the discovery and production of any document.

(c) Receiving evidence on affidavits.

(d) Requisitioning any public record or copy thereof from any office.

(e) Any other matters which may be prescribed.

(2) The Commission shall have the power to require any person, subject to any privilege which may be claimed by that person under any law for the time being in force, to furnish information on such points or matters as in the opinion of the Commission may be useful for, or relevant to any matter under the consideration of the Commission and any person so required shall be deemed to be legally bound to furnish such information within the meaning of Sec. 176 of the Indian Penal code, 1860 (45 of 1860).

(3) The Commission shall be deemed to be a civil court and when any offence described in Sections. 175, 178, 179, 180 or Sec. 228 of the Indian Penal Code, 1860 (45 of 1860), is committed in the view or presence of the Commission, the Commission may, after recording the facts constituting the offence and the statement of the accused as provided for in the Code of Criminal Procedure, 1898 (5 of 1898)11[11] forward the case to a Magistrate having jurisdiction to try the same and the Magistrate to whom any such case is forwarded shall proceed to hear the complaint against the accused as if the case had been forwarded to him under Section 482 of the said Code12[12].

(4) Any proceeding before the Commission shall be deemed to be a judicial proceeding within the meaning of Sections. 193 and 228 of the Indian Penal Code, 1860

8. Explain the present scenarios of infrastructure financing methods?

Answer:

1. Municipal bonds

This methodology is an excellent opportunity but is least used to mobilize debt financing. Indian government offers two types of municipal bonds: Revenue Bonds and Government Obligation Bonds. Government has come in association with IL&FS to induce good credit quality and reliability in debt instrument market. If local government wants to issue municipal bonds, they

need to provide financial structure (Type of dent: GO or RO, terms, repayment plan, interest rates), credit rating issued by ICRA or CARE, authorization and approval documents, prospectus (information of potential investors, disclosures), guarantees and transaction costs

2. **Pool Financing**

Due to the budgetary constraints, it was difficult for local small governments to exploit the 'municipal bond mechanism' and generate long term financing debt. The other issues with municipal bonds was high fixed issuance cost percentage and availability in less quantity and hence they weren't able to lure the institutional investors.

Pooling technique is used in order to facilitate a SPV and create the inertest of capital market for local small government. Tamil Nadu and Karnataka were the first two states to use this technique in 2002 to issue the bonds of ₹ 130.4 Crore for sanitization and water project in 14 local governments. It used the US based bond bank model which hypothetically form and administer a SPV and also issue the bonds on its own name for the group of local governments. From this hypothetical unit the local government borrows and the repayment of these borrowed funds is done by the pooled government.

3. **Urban infrastructure funds**

A local government which is inefficient in raising commercial capital on its own due to less credit rating or structural bottlenecks, UIFs is an initiative by government. Four types of funds (Capital fund, project development funds and credit rating enhancement fund, Grant fund) are maintained are managed by the PDC or internal staff. The main objectives of these funds are to provide the access of funds to the incompetent local government, reduce cost of capital, promote PPP and develop urban infrastructure projects.

4. **Microfinance**

This new innovative tool is to facilitate the triple bottom population and provide them opportunities to build infrastructure. India's more than 30% population lives in slum areas and seeing their financial weakness, no commercial bank or municipal bond is accessible. SKS, APS (2004) and other MFIs took the responsibility and provided funds at high interest rates. Even though this tool is to promote more PPP, but interest rates are very high that repayments become default.

5. **Public Private Partnership**

The major challenges faced by infrastructure financing are non channelized savings (1/3rd of savings are in physical assets), regulated earning, mismatch in asset and liability, immature debt markets, limited resources and also high regulatory constraints. PPP (public private partnership) using various partnership model (BOT, DBB, BOO, BOOT) is to facilitate easy access of capital for infrastructure projects. One of the tools of PPP is VGF (viability gap financing) which had high return but high risk as well. New financing resources need to be developed not only on the debt side but also on the equity side.

6. **NBFC and FIs**

Even thought NBFC institutes have huge potential and growth momentum, many bureaucratic guidelines trap the capital for a long time and hence create undiversified risk. To boost the confidence of these investors and facilitate requirements, asset as well as liability side management needs to be looked into.

On the asset side modifications in securitization norms, underwriting norms and NBFC norms are required. The current NBFC guidelines can be altered by relaxing the limit on single and group borrower and on capital funded. Similarly on the liability side allowing FIs, banks and NBFCs to borrow from foreign institutes, long term hedging using gold and reducing the SLR limits will help banks diversify the constituted risk.

7. **Debt financing by Indian commercial banks**

Many Indian banks such as SBI, IDB, and PNB gives loan for infrastructure financing. Indian government has legalized few banks in country to issue debt for infrastructure financing in urban area. These loans are easily available but contain complex procedure, as for banks there are high default risk involves. Moreover one more disadvantage with commercial banks loan is high interest rates which discourage investors to raise money from these resources.

8. **International Debt financing**

The main resources of international debt financing are international funds, multilateral agencies, equipment suppliers, export credit agencies, bond markets, and commercial banks. Many dedicated funds from world development banks have been given (from $200 million). Many bilateral agencies also fund infrastructure projects but opportunities are very limited in this aspect.

9.

a) Which areas in future market are profitable?

b) Today is 24th March. A refinery needs 1,050 barrels of crude oil in the month of September. The current price of crude oil is ₹ 3,000 per barrel. September futures contract at Multi Commodity Exchange (MCX) is trading at ₹ 3,200. The firm expects the price to go up further and beyond ₹ 3,200 in September. It has the option of buying the stock now. Alternatively it can hedge through futures contract.

a. If the cost of capital, insurance, and storage is 15% per annum, examine if it is beneficial for the firm to buy now?

b. Instead, if the upper limit to buying price is ₹ 3,200 what strategy can the firm adopt?

c. If the firm decides to hedge through futures, find out the effective price it would pay for crude oil if at the time of lifting the hedge

i) The spot and futures price are ₹ 2,900 and ₹ 2,910 respectively,

ii) The spot and futures price are ₹ 3,300 and ₹ 3,315 respectively.

Answer:

a)

Action	Impact
Cover raw material price risk	Certainty in input cost. Certainty in cost of production
Cover the export commitment	Certainty about profits. Certainty in income
Cover input requirements through futures market	Less financing requirements; reduced interest cost. Reduces cost of production. Increase in profits
Buy in futures market	Save on strong and storage management costs. Increase in profitability

b)

(a) If cost of carry (including interest, insurance, and storage) is 15%, the fair price of the futures contract is $s_0 \times e^{-rt} = 3,000 \times e^{-6/12 \times 0.15} =$ ₹ 3,233.65.

It implies that the firm buys crude oil today to be used after six months it would effectively cost ₹ 3,233.65 per barrel.

(b) Since futures are trading at ₹ 3,200 it can lock-in the price of around ₹ 3,200 through a long hedge. Under long hedge the firm would buy the futures on crude oil today and sell it six months later while simultaneously meeting the physical requirements from the market at the price prevailing at that time. Irrespective of price six months later, the firm would end up paying a price of around ₹ 3,200.

(c) If the firm adopts the strategy as mentioned in (b), the effective price to be paid by the firm in cases of rise and fall in spot values is shown below:-

Quantity of crude oil to be hedged	=1,075 barrels
Size of one futures contract	= 100 barrels
No. of futures contracts bought 1,075/100	= 11 contracts (Rounded)
Futures price	= ₹ 3,200
Exposure in futures 3,200 x 11 x 100	= ₹ 35,20,000

Six months later the firm would unwind its futures position and buy the requirement from the spot market.

	₹	₹
Futures sold at price	2910	3315
Amount of futures sold	32,01,000	36,46,500
Gain/Loss on futures (11 contracts)	(3,19,000)	1,26,500
Spot Price	2,900	3,300
Actual Cost of buying(1075 barrels)	31,17,500	35,47,500
Effective cost of buying	34,36,500	34,21,000
Effective Price	**3,197**	**3,182**

SECTION – B

10. What are the sources of credit rating information? Explain the process of credit rating?

Answer:

The following are the important sources of credit rating information-

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 requisite information. The transactions should be carefully scrutinised and interpreted in light of changes in the ensuing period for finding out the credit risk involved.

5) Published Financial Statements: Published Financial Statements of a customer, read along with its Audit Report and Observations, (in case of limited Companies) can be examined to determine the creditworthiness.

6) Reports from Point of Sale: Credit-worthiness can be evaluated by the reports provided by consulting salesmen or persons engaged at the point of sale. Such reports provide first hand information to the Company for proper determination of the credit limit.

7) Reports from other agencies: Non-Banking Financial Companies (Leasing Companies, etc.) may maintain a list of defaulting customers / suit-filed cases, etc. Sometimes, this information may also be obtained by other Companies on request basis. Credit Information Bureau of India Limited (CIBIL) is one entity which maintains a detailed list of defaulters.

Process of Credit Rating:

The steps involved in the Credit Rating 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 contains analysis of the issues viz. historical performance, competitive position, business risk profile, business strategies, financial policies and evaluation of outlook for performance. Information requirements 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 the information gathered, the analysts submit the report to the Rating team. The authenticity and validity of the information submitted influences the credit rating activity.

4) Evaluation by Rating Committee: Rating Committee is the final authority for assigning ratings. The rating team makes a brief presentation about the issuers' business and the management. All the issues identified during discussions stage 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 review of the 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.

11. What do you mean by liquidity risk? Explain the causes of Liquidity Risk. Why asset backed risk matters?

Answer:

In finance, **liquidity risk** is the risk that a given security or asset cannot be traded quickly enough in the market to prevent a loss (or make the required profit).

Causes of liquidity risk

Liquidity risk arises from situations in which a party interested in trading an asset cannot do it because nobody in the market wants to trade for that asset. Liquidity risk becomes particularly important to parties who are about to hold or currently hold an asset, since it affects their ability to trade.

Manifestation of liquidity risk is very different from a drop of price to zero. In case of a drop of an asset's price to zero, the market is saying that the asset is worthless. However, if one party cannot find another party interested in trading the asset, this can potentially be only a problem of the market participants with finding each other. This is why liquidity risk is usually found to be higher in emerging markets or low-volume markets.

Liquidity risk is financial risk due to uncertain liquidity. An institution might lose liquidity if its credit rating falls, it experiences sudden unexpected cash outflows, or some other event causes counterparties to avoid trading with or lending to the institution. A firm is also exposed to liquidity risk if markets on which it depends are subject to loss of liquidity.

Market and funding liquidity risks compound each other as it is difficult to sell when other investors face funding problems and it is difficult to get funding when the collateral is hard to sell. Liquidity risk also tends to compound other risks. If a trading organization has a position in an illiquid asset, its limited ability to liquidate that position at short notice will compound its market risk. Suppose a firm has offsetting cash flows with two different counterparties on a given day. If the counterparty that owes it a payment defaults, the firm will have to raise cash from other sources to make its payment. Should it be unable to do so, it too will default. Here, liquidity risk is compounding credit risk.

A position can be hedged against market risk but still entail liquidity risk. This is true in the above credit risk example—the two payments are offsetting, so they entail credit risk but not market risk. Another example is the 1993 *Metallgesellschaft* debacle. Futures contracts were used to hedge an Over-the-counter finance OTC obligation. It is debatable whether the hedge was effective from a market risk standpoint, but it was the liquidity crisis caused by staggering margin calls on the futures that forced Metallgesellschaft to unwind the positions.

Accordingly, liquidity risk has to be managed in addition to market, credit and other risks. Because of its tendency to compound other risks, it is difficult or impossible to isolate liquidity risk. In all but the most simple of circumstances, comprehensive metrics of liquidity risk do not exist. Certain techniques of asset-liability management can be applied to assessing liquidity risk. A simple test for liquidity risk is to look at future net cash flows on a day-by-day basis. Any day that

has a sizeable negative net cash flow is of concern. Such an analysis can be supplemented with stress testing. Look at net cash flows on a day-to-day basis assuming that an important counterparty defaults.

Analyses such as these cannot easily take into account contingent cash flows, such as cash flows from derivatives or mortgage-backed securities. If an organization's cash flows are largely contingent, liquidity risk may be assessed using some form of scenario analysis. A general approach using scenario analysis might entail the following high-level steps:

- ❖Construct multiple scenarios for market movements and defaults over a given period of time
- ❖Assess day-to-day cash flows under each scenario.

Because balance sheets differ so significantly from one organization to the next, there is little standardization in how such analyses are implemented.

Regulators are primarily concerned about systemic and implications of liquidity risk.

Asset Backed risk Matters: Asset-backed securities have several important benefits. Primarily, they give lenders a way to obtain cash for more lending, and they offer investors a way to invest in a diversified group of income-producing assets.

The ABS market is not always as overvalued as the markets for other income-producing securities such as corporate bonds or Treasuries. For this reason, investors must carefully examine the features and underlying assets of a particular ABS before investing.

Note that the ABS are subject to prepayment risk; that is, if any of the borrowers pay their cars off early, this reduces the cash flows ultimately going to the ABS investors.

12.

a) What are the hedging strategies?

b) Sandeep Ltd will be receiving ₹ 120 Lakhs by way of interim dividend from its subsidiary in 4 months. At the end of the year it will be receiving ₹220 Lakhs by way of final dividend and interest on loans to subsidiaries. What is the present value of such interest and dividends if the weighted average cost of capital for Sandeep Ltd is 13.50% and the Company discounts continuous compounding for income by way of dividends and interests?

Answer:

a) A wide range of hedging strategies is available to hedge funds. For example:

- ❖ Selling short - selling shares without owning them, hoping to buy them back at a future date at a lower price in the expectation that their price will drop.
- ❖ Using arbitrage - seeking to exploit pricing inefficiencies between related securities - for example, can be long convertible bonds and short the underlying issuer's equity.
- ❖ Trading options or derivatives - contracts whose values are based on the performance of any underlying financial asset, index or other investment.
- ❖ Investing in anticipation of a specific event - merger transaction, hostile takeover, spin-off, exiting of bankruptcy proceedings, etc.
- ❖ Investing in deeply discounted securities - of companies about to enter or exit financial distress or bankruptcy, often below liquidation value.
- ❖ Many of the strategies used by hedge funds benefit from being non-correlated to the direction of equity markets

b)

1. Present Value under continuous compounding approach

(Computation of Factors)

Present Value (P) = $A \times e^{-rxt}$ or $A \div e^{rXt}$

Where, A = Future Cash Flow

e = Exponential Value (i.e. 2.71828)

r = Rate of Interest = 13.50% or 0.135

t = No. of Years i.e. Period /Year = 4 Months / 12 Months i.e. 1/3 and = 12 Months / 12 Months i.e. 1

2. Present Value of Cash Flows

Time	Nature of Cash Flow	Cash Flow (₹)	PV Factor at 13.50%	Discounted Cash Flow (₹)
(1)	**(2)**	**(3)**	**(4)** = $[1 \div e^{0135x(1)/12}]$	**(5)** = **(3)X(4)**
4	Interim Dividend	1,20,00,000	0.9560 $[1 \div e^{0.135x4/12}]$	₹1,14,72,000
12	Final Dividend and Interest	2,20,00,000	0.8737 $[1 \div e^{0.135x12/12}]$	₹1,92,21,400
Total				₹3,06,93400

13.

a) Mention the key characteristics of hedge funds.

b) The price of Compact Stock of a face value of ₹10 on 31st December, 2012 was ₹414 and the futures price on the same stock on the same date i.e., 31st December, 2012 for March, 2013 was ₹444.

Other features of the contract and the related information are as follows.

- **Time to expiration 3 months (0.25 year)**
- **Annual dividend on the stock of 30% payable before 31.3.2012.**
- **Borrowing Rate is 20 % p.a.**

Based on the above information, calculate future price for Infosys stock on 31st December, 2012. Please also explain whether any arbitrage opportunity exists.

Answer:

a)

- Hedge funds utilize a variety of financial instruments to reduce risk, enhance returns and minimize the correlation with equity and bond markets. Many hedge funds are flexible in their investment options (can use short selling, leverage, derivatives such as puts, calls, options, futures, etc.).

- Hedge funds vary enormously in terms of investment returns, volatility and risk. Many, but not all, hedge fund strategies tend to hedge against downturns in the markets being traded.
- Many hedge funds have the ability to deliver non-market correlated returns.
- Many hedge funds have as an objective consistency of returns and capital preservation rather than magnitude of returns.
- Most hedge funds are managed by experienced investment professionals who are generally disciplined and diligent.
- Pension funds, endowments, insurance companies, private banks and high net worth individuals and families invest in hedge funds to minimize overall portfolio volatility and enhance returns.
- Most hedge fund managers are highly specialized and trade only within their area of expertise and competitive advantage.
- Hedge funds benefit by heavily weighting hedge fund managers' remuneration towards performance incentives, thus attracting the best brains in the investment business. In addition, hedge fund managers usually have their own money invested in their fund.
- Performance of many hedge fund strategies, particularly relative value strategies, is not dependent on the direction of the bond or equity markets -- unlike conventional equity or mutual funds (unit trusts), which are generally 100% exposed to market risk

The popular misconception is that all hedge funds are volatile -- that they all use global macro strategies and place large directional bets on stocks, currencies, bonds, commodities, and gold, while using lots of leverage. In reality, less than 5% of hedge funds are global macro funds. Most hedge funds use derivatives only for hedging or don't use derivatives at all, and many use no leverage.

b)

Securities of	Compact
Spot Price [S_X]	₹414
Expected rate of Dividend [y]	30% or 0.30
Borrowing Rate	20%
Tenor / Time Period [t] in Years	3 Months or 0.25 Year
Present Value of Dividend	= 30% x 10 x $e^{-0.20x0.25}$ = 30% X 10 ÷ 1.05127 = 2.8537
Adjusted Spot Price [Spot Price- Present Value of Dividend] [AS_X]	= 414 - 2.8537 =₹411.1463
Theoretical Forward Price [TFP_X] $TFP_X = AS_X X\ e^{(r-y)xt}$	= ₹411.1463 x $e^{0.20x0.25}$ = ₹411.1463 X $e^{0.05}$ = ₹411.1463 x 1.05127 = ₹432.23
3-Months Futures Contract Rate [AFP_X]	₹ 444
TFP_x Vs. AFP_x	AFP_X is Higher

Inference	AFP_X is overvalued
Recommended Action	Buy Spot. Sell Future.

2. Cash Flows to Gain on the Arbitrage Opportunity

Activity Flow:

(a) Borrow ₹414 for a period of 3 months at the rate of 20% p.a.

(b) Buy the Stock at ₹414 at T_0

(c) Receive the Dividend at the time of 3 months [₹10 X 30% = ₹3].

(d) Sell the Index Futures at the Forward Price at the end of 3 months [₹444].

(e) repay the amount of Loan with interest at the end of the period.

Cash Flows arising out of the Activities to gain on the Arbitrage.

Sl. No.	Particulars	₹
(a)	Borrow for a period of 3 months and Buy Stock at T_o	₹ 414
(b)	Receive the Dividend at the end of 3 months	3
(c)	Sell the Futures at the Forward Price at the end of 3 months	444
(d)	Repay the amount of borrowing together with Interest = [414(1+0.20x0.25)]	(434.7)
(e)	**Net Cash Inflow [(c)-(d)]**	**9.3**

14.

a) Mr. Khan established the following spread on the Alpha Corporation's stock:

(i) Purchased one 3-month call option with a premium of ₹20 and an exercise price of ₹550.

(ii) Purchased one 3-month put option with a premium of ₹10 and an exercise price of ₹450.

Alpha Corporation's stock is currently selling at ₹500. Determine profit or loss, if the price of Alpha Corporation's:

(i) remains at ₹500 after 3 months.

(ii) falls at ₹350 after 3 months.

(iii) rises to ₹600.

Assume the size option is 100 shares of Alpha Corporation.

b) MNC rolls over a $25 million loan priced at LIBOR on a three-month basis. The company feels that interest rates are rising and that rates will be higher at the next roll- over date in three months. Suppose the current LIBOR is 5.4375%. Explain how MNC can use FRA at 6% offered by a bank to reduce its interest rate its FRA? Assume the three month period as 90 days.

Answer:

a)

1. Pay off for Call Option				
Spot Price (1)	**Exercise Price (2)**	**Action (3)**	**Gross Value (4) = (2)-(I)**	**Net Pay-Off (5) = (4) — Premium of ₹30**
350	550	Lapse	Nil	**(20)**
500	550	Lapse	Nil	**(20)**
600	550	Exercise	50	**30**

2. Pay off for Put Option				
Spot Price (1)	**Exercise Price (2)**	**Action (3)**	**Gross Value (4) = (2)-(I)**	**Net Pay-Off (5) =(4) — Premium of ₹10**
350	450	Exercise	100	**90**
500	450	Lapse	Nil	**(10)**
600	450	Lapse	Nil	**(10)**

3. Net Payoff Table					
Spot Price (1)	**Net Payoff in Call Option (2)**	**Net Payoff in Put Option (3)**	**Total (4)**	**No. of Options (5)**	**Net Profit of Spread (6)=4X5**
350	(20)	90	70	100	7,000
500	(20)	(10)	(30)	100	(3,000)
600	30	(10)	20	100	2,000

b)

MNC can use 3 x 6 FRA, if it expects that the rates would be higher at the next roll- over of three months, starting three months from today. In other words MNC would buy 3 x 6 FRA @6.25%, clearly with a view that higher rate would prevail on the settlement date i.e. 3 months from now.

Now if on the settlement date, the rate is 6.5%, then MNC's decision to buy 3 x 6 FRA has been proved right and it would receive the present value of the interst differentials on the loan amount i.e. it would receive:

$$\text{Pay off} = \text{national amount} \times \frac{(\text{reference Rate} - \text{Fixed rate})}{1 + \text{Reference Rate} \times \alpha} \text{ (a is the day count function)}$$

$$= \$2,50,00,000 \times \frac{(0.065 - 0.0625) \times 90/360}{1 + 0.0625 \times 90/360} = \$15,385$$

15.

a) What do you mean by exchange rate risk management? How many types of exchange rate risk- Explain? What are the determinants of Foreign Exchange Rates?

b) A Laptop Bag is priced at $ 105.00 at New York. The same bag is priced at ₹ 4,250 in Kolkata. Determine Exchange Rate in Kolkata.

i. **If, over the next one year, price of the bag increases by 7% in Kolkata and by 4% in New York, determine the price of the bag at Kolkata and-New York? Also determine the exchange rate prevailing at New York for ₹ 100.**
ii. **Determine the appreciation or depreciation in Re. in one year from now.**

Answer:

a) Foreign exchange risk is the level of uncertainty that a company must manage for changes in foreign exchange rates that will adversely affect the money the company receives for goods and services over a period of time.

For example, a company sells goods to a foreign company. They ship the goods today, but will not receive payment for several days, weeks or months. During this grace period, the exchange rates fluctuate. At the time of settlement, when the foreign company pays the domestic company for the goods, the rates may have traveled to a level that is less than what the company contemplated. As a result, the company may suffer a loss or the profits may erode.

To minimize or manage the risk, companies enter into contracts to buy foreign currency at a specified rate. This allows the companies to minimize the uncertainty of the risk, so that they can price their products accordingly.

A common definition of exchange rate risk relates to the effect of unexpected exchange rate changes on the value of the firm (Madura, 1989). In particular, it is defined as the possible direct loss (as a result of an unhedged exposure) or indirect loss in the firm's cash flows, assets and liabilities, net profit and, in turn, its stock market value from an exchange rate move. To manage the exchange rate risk inherent in every multinational firm's operations, a firm needs to determine the specific type of current risk exposure, the hedging strategy and the available instruments to deal with these currency risks.

Multinational firms are participants in currency markets by virtue of their international transactions. To measure the impact of exchange rate movements on a firm that is involved in foreign-currency denominated operations, i.e., the implied value-at-risk (VaR) from exchange rate moves, we need to identify the type of risks that the firm is exposed to and the amount of risk encountered (Hakala and Wystup, 2002).

Types of Exchange Rate Risk

The three main types of exchange rate risk are

1. **Transaction risk**, which is basically cash flow risk and deals with the effect of exchange rate moves on transactional account exposure related to receivables (export contracts), payables (import contracts) or repatriation of dividends. An exchange rate change in the currency of denomination of any such contract will result in a direct transaction exchange rate risk to the firm;
2. **Translation risk**, which is basically balance sheet exchange rate risk and relates exchange rate moves to the valuation of a foreign subsidiary and, in turn, to the consolidation of a foreign subsidiary to the parent company's balance sheet. Translation risk for a foreign subsidiary is usually measured by the exposure of net assets (assets less liabilities) to potential exchange rate moves. In consolidating financial statements, the translation could be done either at the end-of-the-period exchange rate or at the average exchange rate of the period, depending on the accounting regulations affecting the parent company. Thus, while income

statements are usually translated at the average exchange rate over the period, balance sheet exposures of foreign subsidiaries are often translated at the prevailing current exchange rate at the time of consolidation; and

3. **Economic risk**, which reflects basically the risk to the firm's present value of future operating cash flows from exchange rate movements. In essence, economic risk concerns the effect of exchange rate changes on revenues (domestic sales and exports) and operating expenses (cost of domestic inputs and imports). Economic risk is usually applied to the present value of future cash flow operations of a firm's parent company and foreign subsidiaries. Identification of the various types of currency risk, along with their measurement, is essential to develop a strategy for managing currency risk

Foreign Exchange Rates – Determinants:

1. **Interest Rate Differentials:** Higher rate of interest for a investment in a particular currency can push up the demand for that currency, which will increase the exchange rate in favour of that currency.
2. **Inflation Rate Differentials:** Different countries' have differing inflation rates, and as a result, purchasing power of one currency wall depreciate faster than currency of some other country. This contributes to movement in exchange rate.
3. **Government Policies:** Government may impose restriction on currency transactions. Through RBI, the Government, may also buy or sell currencies in huge quantity to adjust the prevailing exchange rates.
4. **Market Expectations:** Expectations on changes in Government, changes in taxation policies, foreign trade, inflation, etc. contributes to demand for foreign currencies, thereby affecting the exchange rates.
5. **Investment Opportunities:** Increase in investment opportunities in one country leads to influx of foreign currency funds to that country. Such huge inflow will amount to huge supply of that currency, thereby bringing down the exchange rate.
6. **Speculations:** Speculators and Treasury Managers influence movement in exchange rates by buying and selling foreign currencies with expectations of gains by exploiting market inefficiencies. The quantum of their operations affects the exchange rates.

b) 1. Exchange Rate in Kolkata (Purchasing Power Parity Theory)
Exchange Rate in Kolkata per $ = Bag Price in ₹ at Kolkata / Bag Price in $ at New York = ₹ 4,250 ÷ USD 105 = ₹ 40.4762

2. Price in a Year's time
Kolkata = Prevailing Price X (1 + Increase in Rate) = ₹ 4250 X (1 + 7%)
= ₹ 4,250 x 1.07 = ₹ 4,547.50
New York = Prevailing Price x (1 + Increase m Rate) = USD 105 X (1 + 4%)
= USD 105 X 1.04 = USD 109.20

3. Exchange Rate in New York (after one year)
Exchange Rate in New York per ₹ 100
= Bag Price in $ at New York/ Bag Price in ₹ at Kolkata x ₹ 100
= (USD 109.20 ÷ ₹ 4.547.50) x ₹ l00= USD 2.4013

4. Depreciation (in %) of Re. over the year
Depreciation = [(1 + Indian Inflation Rate) / (1 + New York Inflation Rate)] - 1
= [(1 + 7%) / (1 + 4%)] - 1 = 1.07 / 1.04 - 1 = 2,88%
Alternatively = (Future Spot Rate ₹ / $ - Spot Rate of ₹ / $) ÷ Spot Rate X 100

Future Spot = Bag Price in Kolkata/Bag Price in New York in one year
= ₹4,547.50/USD109.20 = ₹ 41.6438

Depreciation= (Future Spot ₹ 41.6438 - Spot Rate ₹ 40.4762) ÷ Spot Rate ₹40.4762 x 100 = ₹ 1.1676 ÷ ₹ 40.4762 X 100 = 2.88%

16. What is a depository receipt? How does the DR work? Explain the benefits of depository receipts? What is the process for raising equity through ADR?

Answer:

A depositary receipt (DR) is a type of negotiable (transferable) financial security that is traded on a local stock exchange but represents a security, usually in the form of equity, that is issued by a foreign publicly listed company. The DR, which is a physical certificate, allows investors to hold shares in equity of other countries. One of the most common types of DRs is the American depositary receipt (ADR), which has been offering companies, investors and traders global investment opportunities since the 1920s.

Since then, DRs have spread to other parts of the globe in the form of global depositary receipts (GDRs) (the other most common type of DR), European DRs and international DRs. ADRs are typically traded on a U.S. national stock exchange, such as the New York Stock Exchange (NYSE) or the American Stock Exchange, while GDRs are commonly listed on European stock exchanges such as the London Stock Exchange. Both ADRs and GDRs are usually denominated in U.S. dollars, but can also be denominated in euros.

DR works:

The DR is created when a foreign company wishes to list its already publicly traded shares or debt securities on a foreign stock exchange. Before it can be listed to a particular stock exchange, the company in question will first have to meet certain requirements put forth by the exchange. Initial public offerings, however, can also issue a DR. DRs can be traded publicly or over-the-counter. Let us look at an example of how an ADR is created and traded.

The Benefits of Depositary Receipts

The DR functions as a means to increase global trade, which in turn can help increase not only volumes on local and foreign markets but also the exchange of information, technology, regulatory procedures as well as market transparency. Thus, instead of being faced with impediments to foreign investment, as is often the case in many emerging markets, the DR investor and company can both benefit from investment abroad.

Benefits :

For the Company

A company may opt to issue a DR to obtain greater exposure and raise capital in the world market. Issuing DRs has the added benefit of increasing the share's liquidity while boosting the company's prestige on its local market ("the company is traded internationally"). Depositary receipts encourage an international shareholder base, and provide expatriates living abroad with an easier opportunity to invest in their home countries. Moreover, in many countries, especially those with emerging markets, obstacles often prevent foreign investors from entering the local market. By issuing a DR, a company can still encourage investment from abroad without having to worry about barriers to entry that a foreign investor might face.

For the Investor

Buying into a DR immediately turns an investors' portfolio into a global one. Investors gain the benefits of diversification while trading in their own market under familiar settlement and clearance conditions. More importantly, DR investors will be able to reap the benefits of these

usually higher risk, higher return equities, without having to endure the added risks of going directly into foreign markets, which may pose lack of transparency or instability resulting from changing regulatory procedures. It is important to remember that an investor will still bear some foreign-exchange risk, stemming from uncertainties in emerging economies and societies. On the other hand, the investor can also benefit from competitive rates the U.S. dollar and euro have to most foreign currencies.

Giving you the opportunity to add the benefits of foreign investment while bypassing the unnecessary risks of investing outside your own borders, you may want to consider adding these securities to your portfolio. As with any security, however, investing in ADRs requires an understanding of why they are used, and how they are issued and traded.

Process for Raising Equity through ADR:

(a) **Issue Intermediaries**: ADRs are issued by Overseas Depository Bank (ODB), who has a Domestic Custodian Bank (DCB) in India.

(b) **Deposit of Securities**: Company willing to raise equity through ADRs should deposit the securities with the DCB in India.

(c) **Authorization for Issue of ADRs**: The Indian Company authorizes the ODB to issue ADR against the security of Company's Equity Shares.

(a) **Issue of ADR**: ODB issues ADRs to investors at a predetermined ratio to the Company's securities.

(d) **Redemption of ADR**: When an investor redeems his ADRs, the appropriate number of underlying equity shares or bonds is released.

(e) **Dividend / Interest**: The Indian Company pays interest to the ODB, which in turn distributes dividends to the ADR holders based on the prevailing exchange rate.

17.

a) What is Arm's Length Principle? Why Arm's Length Pricing determine? What are the difficulties in applying the arm's length principle?

b) XYZ Ltd is considering a project in US, which will involve an initial investment of US $1,10,00,000. The project will have 5 years of life. Current spot exchange rate is ₹ 48 per US $. The risk free rate in US is 8% and the same in India is 12%. Cash inflows from the project are as follows —

Years	**1**	**2**	**3**	**4**	**5**
Cash Inflow (US $)	20,00,000	25,00,000	30,00,000	40,00,000	50,00,000

Calculate the NPV of the project using foreign currency approach. Required rate of return on this project is-14%.

Answer:

a) Arm's Length Principle:

The arm's length principle seeks to ensure that transfer prices between members of an MNE ("controlled transactions"), which are the effect of special relationships between the enterprises, are either eliminated or reduced to a large extent. It requires that, for tax purposes, the transfer prices of controlled transactions should be similar to those of comparable

transactions between independent parties in comparable circumstances ("uncontrolled transactions"). In other words, the arm's length principle is based on the concept that prices in uncontrolled transactions are determined by market forces and, therefore, these are, by definition, at arm's length. In practice, the "arm's-length price" is also called "market price". Consequently, it provides a benchmark against which the controlled transaction can be compared.

The Arm's Length Principle is currently the most widely accepted guiding principle in arriving at an acceptable transfer price. As circulated in 1995 OECD guidelines, it requires that a transaction between two related parties is priced just as it would have been if they were unrelated. The need for such a condition arises from the premise that intra-group transactions are not governed by the market forces like those between two unrelated entities. The principle simply attempts to place uncontrolled and controlled transactions on an equal footing.

Why Arm's Length Pricing?

The basic object of determining Arm's Length Price is to find out whether any addition to income is warranted or not, if the following situations arises:

(a) Selling Price of the Goods < Arm's Length Price

(b) Purchase Price > Arm's Length Price

Total Income as disclosed by an Assessee	**XXXX**
Add: Understatement of profit due to overstatement of purchase price **Add: Understatement of profit due to understatement of selling price**	**XXX** **XXX**
Total Income after Assessment	**XXXX**

Role of market forces in determining the "Arm's Length Price"

In case of transactions between Independent enterprises, the conditions of their commercial and financial relations (e.g. The price of goods transferred or services provided and the conditions of the transfer or provision) are, ordinarily, determined by the market force.

Whereas,

In case of transactions between MNEs (Multinational Enterprises), their commercial and financial relations may not be affected by the external forces in the same way, although associated enterprises often seek to replicate the dynamics of the market forces in their dealings with each other.

Difficulties in applying the arm's length principle

The arm's length principle, although survives upon the international consensus, does not necessarily mean that it is perfect. There are difficulties in applying this principle in a number of situations.

(a) The most serious problem is the need to find transactions between independent parties which can be said to be exact compared to the controlled transaction.

(b) It is important to appreciate that in an MNE system, a group first identifies the goal and then goes on to create the associated enterprise and finally, the transactions entered into. This procedure obviously does not apply to independent enterprises. Due to these facts, there may be transactions within an MNE group which may not be between independent enterprises.

(c) Further, the reductionist approach of splitting an MNE group into its component parts before evaluating transfer pricing may mean that the benefits of economies of scale, or integration between the parties, is not appropriately allocated between the MNE group.

(d) The application of the arm's length principle also imposes a burden on business, as it may require the MNE to do things that it would otherwise not do (i.e. searching for comparable transactions, documenting transactions in detail, etc).

(e) Arm's length principle involves a lot of cost to the group.

b) 1. Computation of Discount Rate

Note: It is assumed that the required rate of return of 14% (Risk Adjusted Rate) is for rupee inflows.

1 + Risk Adjusted Rate = (1 + Risk Free Rate) X (1 + Risk Premium for the project)
1 + 14% = (1 + 12%) x (1 + Risk Premium)
1.14 = 1.12 x (1 + Risk Premium)
1 + Risk Premium = 1.14 ÷ 1.12 = 1.01786
Risk Premium = 0.01786 or 1.786%

Therefore, Risk Adjusted Discount Rate for Dollar Flows is
(1 + Risk Adjusted Discount Rate) = (1 + USD Risk Free Rate) X (1 + Project Risk Premium)
= (1 + 8%) x (1 + 1.786%)
= 1.08 x 1.01786 = 1.09929
Risk Adjusted Discount Rate = 1.09929 - 1 = 0.09929 or **9.93%**

2. Computation of Net Present Value **[USD in Lakhs]**

Particulars	Year	PV Facfor @9.93%	Cash Flow	Disc. Cash Flow
Annual Cash Inflow	1	$1 \div 1.0993 = 0.910$	20.00	18.20
	2	$1 \div 1.0993^2 = 0.827$	25.00	20.68
	3	$1 \div 1.0993^3 = 0.753$	30.00	22.59
	4	$1 \div 1.0993^4 = 0.685$	40.00	27.40
	5	$1 \div 1.0993^5 = 0.623$	50.00	31.15
Present Value of Cash Inflows Less: Initial Investment				120.02 (110.00)
Net Present Value (in USD Lakhs)				10.02
NPV in ₹ Lakhs [USD 10.02 x Spot Rate 48.00 per USD]				480.96

Section – C

18.

a) Define Security Analysis? What are the factors considered in company analysis?

b) A Ltd., and B Ltd., has the following risk and return estimates

R_A	R_B	σ_A	σ_B	(Correlation coefficient) = r_{AB}
20%	22%	18%	15%	-1.50

Calculate the proportion of investment in A Ltd., and B Ltd., to minimize the risk of Portfolio.

Answer:

a) Security is an instrument of promissory note or a method of borrowing or lending, or a source of contributing to the funds needed by the corporate body or non-corporate body.
Portfolio is a combination of securities with different risk-return characteristics will constitute portfolio of the investor.
Security analysis is the first part of investment decision process involving the valuation and analysis of individual securities. Security Analysis is primarily concerned with the analysis of a security with a view to determine the value of the security, so that appropriate decisions may be made based on such valuation as compared with the value placed on the security in the market.

Factors considered in Company Analysis are:

(A) Net Worth and Book Value:

(i) Computation:

Particulars	Amount
Equity Share Capital	XXX
Add: Free Reserves	XXX
Less: Accumulated Losses	(XXX)
Total Net Worth of Business	XXX
Book Value of Share = Total Net Worth Number of Shares Outstanding	XX

(ii) Book Value may not be an indicator of the intrinsic worth of the share, due to the following reasons :-

- First, the market price of the share reflects the future earnings potential of the firm which may have no relationship with the value of its assets. Example: Service Sector, where intrinsic value is based more on future earning potential than on Asset Backing.
- Second, the book value is based upon the historical costs of the assets of the firm and these may be gross underestimates of the cost of the replacement or resale values of these assets.

(B) Sources and utilisation of funds:

(i) The identification of sources and uses of funds is known as Funds Flow and Cash Flow Analysis.
(ii) One of the major uses of Funds Flow Analysis is to find out whether the firm has used Short Term sources of funds to finance Long-Term Investments.
(iii) Such methods of financing increases the risk of liquidity crunch for the firm, as Long-Term Investments, because of the gestation period involved may not generate enough surplus in time to meet the short-term liabilities incurred by the firm. This increases the Credit and Default Risk of the Entity.

(C) Time Series Analysis, Common Sized Statements and Financial Ratio Analysis:

(i) Financial Statements are utilized to make Inter and Intra Firm Comparison.
(ii) The techniques that are used to do such comparative analysis are: Common-Sized Statements, and Financial Ratio Analysis.

(D) Size and Ranking:

(i) A rough idea regarding the size and ranking of the company within the economy, in general, and the industry, in particular, would help the investment manager in assessing the risk associated with the company.

(ii) It may also be useful to assess the position of the company in terms of Technical Know-how, Research and Development activity and price leadership.

(E) Growth Record:

(i) The growth in sales, net income, net capital employed and Earnings per share of the company in the past few years should be examined.

(ii) The following three growth indicators may be looked into in particular:
- Price Earnings ratio,
- Percentage Growth rate of Earnings per annum, and
- Percentage growth rate of net block.

(iii) An evaluation of future growth prospects of the company should be carefully made. This requires an analysis of-
- Existing capacities and their utilization which is indicated by the Quantitative information present in the Financials,
- Proposed expansion and diversification plans and the nature of the company's technology - which is generally indicated by Director's Reports

(iv) Growth is the single most important factor in company analysis tor the purpose of investment management. A company may have a good record of profits and performance in the past; but if it does not have growth potential, its shares cannot be rated high from the investment point of view.

b)

1. Basic Values of Factors for Determination of Portfolio Risk

Standard Deviation of Security A	σ_A	18%
Standard Deviation of Security B	σ_B	15%
Correlation co-efficient of Securities A and B	ρAB	-1.50
Weight of Security A	W_A	a
Weight of Security B	W_B	1-a

2. Computation of Investment in Security A (W_A)

$$\text{Proportion or Investment in A Ltd., } W_A = \frac{\sigma B^2 - Cov_{AB}}{\sigma A^2 + \sigma B^2 - 2Cov_{AB}}$$

Proportion of Investment in B Ltd., $W_B = 1 - W_A$

(a) Computation of Covariance

$$Cov_{AB} = \rho AB \times \sigma A \times \sigma B$$

$$= -1.50 \times 18 \times 15 = -405$$

(b) Proportion of investment in A Ltd.

$$W_A = \left[\sigma Y^2 - Cov_{XY}\right] \div \left[\sigma X^2 + \sigma Y^2 - 2Cov_{XY}\right]$$

$W_A = [15^2 - (-405)] \div [18^2 + 15^2 - 2 \times (-405)]$

$W_A = [225 + 405] \div [324 + 225 + 810] = 630/1359 = 0.46$

(c) Proportion of investment in B Ltd.

$W_B = 1 - 0.46 = 0.54$

19. Write short notes on:

a. Price to Book Ratio
b. Dividend payout ratio
c. Book value per share
d. Bollinger Bands
e. Basic principles of portfolio management
f. Capital Asset Pricing Model (CAPM)

Answer:

a. Price to Book Ratio

Book value is determined by subtracting liabilities from assets. The value of a growing company will always be more than book value because of the potential for future revenue. The price to book ratio (P/B) is the value the market places on the book value of the company. It is calculated by dividing the current price per share by the book value per share (book value / number of outstanding shares). Companies with a low P/B are good value and are often sought after by long term investors who see the potential of such companies. A lower P/B ratio could mean that the stock is undervalued. However, it could also mean that something is fundamentally wrong with the company. As with most ratios, be aware that this varies by industry. This ratio also gives some idea of whether you're paying too much for what would be left if the company went bankrupt immediately. It is also known as the "price-equity ratio".

P/B = Share Price / Book Value per Share

$$\text{P/B Ratio} = \frac{\text{Stock Price}}{\text{Total Assets - Intangible Assets and Liabilities}}$$

b. Dividend payout ratio

Dividend payout ratio is the fraction of net income a firm pays to its stockholders in dividends:

$$\text{Dividend payout ratio} = \frac{Dividends}{net\ Income\ for\ the\ same\ period}$$

The part of the earnings not paid to investors is left for investment to provide for future earnings growth. Investors seeking high current income and limited capital growth prefer companies with high Dividend payout ratio. However investors seeking capital growth may prefer lower payout ratio because capital gains are taxed at a lower rate. High growth firms in early life generally have low or zero payout ratios. As they mature, they tend to return more of the earnings back to investors. Note that dividend payout ratio is calculated as EPS/DPS.

$$\text{Calculated as} = \frac{Yearly\ Dividend\ per\ share}{Earning\ per\ Share}$$

Or equivalently

$$= \frac{Dividends}{net\ Income}$$

The payout ratio provides an idea of how well earnings support the dividend payments. More mature companies tend to have a higher payout ratio. In the U.K. there is a similar ratio, which is known as dividend cover. It is calculated as earnings per share divided by dividends per share.

c. Book value per share

A measure used by owners of common shares in a firm to determine the level of safety associated with each individual share after all debts are paid accordingly.

$$\text{Book value per Share} = \frac{Total\ shareholder - Preferred\ Equity}{Total\ Outstanding\ shares}$$

Should the company decide to dissolve, the book value per common indicates the dollar value remaining for common shareholders after all assets are liquidated and all debtors are paid. In simple terms it would be the amount of money that a holder of a common share would get if a company were to liquidate.

Fundamental analysis can be used to identify companies that represent good value. Hence it is good for long term investments. Valuation techniques vary depending on the industry group. For this reason, a different techniques or model is required for different industry. This can get quite time consuming and limit the amount of research that can be performed. In fundamental analysis, companies should be compared against other companies in the same sector. For example, a software company (Infosys Technologies) should be compared with a software company (Wipro), not to a bank (ICICI Bank).

d. Bollinger Bands

Bollinger Bands represents the space between two lines drawn on either side of the simple moving average. It consists of a centreline and two price channels, one above the centreline and one below. The centreline is an Exponential Moving Average, and the price channels are standard deviations of the stock the chartist is studying. The bands will expand and contract as the price action of an issue becomes volatile (expansion) or becomes bound into a tight trading pattern (contraction). Because standard deviation is a measure of volatility, Bollinger Bands adjust themselves to the market conditions. When the markets become more volatile, the bands widen (move further away from the average), and during less volatile periods, the bands contract (move closer to the average). The tightening of the bands is often used by technical traders as an early indication that the volatility is about to increase sharply.

This is one of the most popular technical analysis techniques. The closer the prices move to the upper band, the more overbought the market, and the closer the prices move to the lower band, the more oversold the market.

The purpose of Bollinger Bands is to provide a relative definition of high and low. By definition, prices are high at the upper band and low at the lower band. This definition can aid in rigorous pattern recognition and is useful in comparing price action to the action of indicators to arrive at systematic trading decisions.

e. Basic principles of portfolio management

There are two basic principles of Portfolio Management, viz.

1. **Effective Investment Planning:** Effective investment planning is made by taking into account —
   i) Fiscal, financial and monetary policies of the Government, and the Reserve Bank of India.

ii) Industrial and economic environment and its impact on industry prospects in terms of prospective technological changes, competition in the market, capacity utilization by the industry and demand prospects, etc.

2. Constant Review of investment: The Portfolio Manager should review the investment in securities on a continuous basis, to identify more profitable avenues for selling and purchasing the investment. This review requires analysis of the following —

i) Assessment of quality of management of the Companies in which investment has already been made or is proposed to be made.

ii) Financial and trend analysis of Companies' Financial Statements, to identify sound Companies with optimum capital structure and better performance and to disinvest the holding of those Companies whose performance is not satisfactory.

iii) Analysis of securities Market and its trend.

The above analysis will help the portfolio manager to arrive at a conclusion as to whether the securities already in possession should be disinvested and new securities be purchased. If, so the timing for investment or dis-investment is also revealed.

f. Capital Asset Pricing Model (CAPM)

William F. Sharpe and John Linter developed the Capital Asset Pricing Model (CAPM). The model is based on the portfolio theory developed by Harry Markowitz. The model emphasises the risk factor in portfolio theory which is a combination of two risks, systematic risk and unsystematic risk. The model suggests that a security's return is directly related to its systematic risk which cannot be neutralized through diversification. The combination of both types of risks stated above provides the total risk. The total variance of returns is equal to market related variance plus company's specific variance. CAPM explains the behavior of security prices and provides a mechanism whereby investors could assess the impact of a proposed securities are determined in such a way that the risk premium or excess return are proportional to systematic risk, which is indicated by the beta coefficient. The model is used for analyzing the risk – return implication of holding securities.

20.

a) The returns on Stock B and Market Portfolio for a period of 6 Years are as follows —

Year	Return on B (%)	Return on Market Portfolio
1	12	8
2	15	12
3	11	11
4	2	-4
5	19	11
6	-10	-2

You are required to determine —

i) Characteristic line for Stock B

ii) The systematic and unsystematic risk of Stock B.

b) ABC Ltd., is a consumer goods company which earns expected return of 14% on its existing operations subject to standard deviation of 20%. The company is owned by a family and the family has no other investment. New project is under consideration and the new project is expected to give a return of 18% subject to standard deviation of 32%. The new project has a correlation of 0.25 with ABC's existing operations.

The new project is likely to account for 25% of ABC's operations.

ABC is identified a utility function to apprise risky project.

The function is as under:-

Shareholder's utility = 100R - σ^2; Where, R = Expected return (in %); σ^2 = Standard deviation of return (in %)

The project can be accepted only if total utility goes up. Evaluate the project.

Answer:

a)

1. Computation of Beta of Security

	Return of		Deviation from Mean		Variance of		Covariance of
Period	**Mkt. (R_M)**	**B (R_B)**	**Mkt. $(R_M - \overline{R}_M)$ (D_M)**	**B $(R_B - \overline{R}_B)$ (D_B)**	**Mkt. (D_M^2)**	**S (D_B^2)**	**R_M & R_B [$D_M \times D_B$]**
(1)	**(2)**	**(3)**	**(4) [(2) – 6.00]**	**(5) [(3) – 7.00]**	**(6) $(4)^2$**	**(7) $(5)^2$**	**(8) (4)× (5)**
1	8	12	2	5	4	25	10
2	12	15	4	8	16	64	32
3	11	11	5	4	25	16	20
4	-4	2	(10)	(5)	100	25	50
5	11	19	5	12	25	144	60
6	-2	-10	(8)	(17)	64	289	136
	36	**49**			**234**	**563**	**308**

	Market Portfolio	Shares of Company (B)
Mean	$\bar{R}M = \sum R_M \div n$ = 36 ÷6 = 6	$\bar{R}_B = \sum R_B \div n$ = 49 ÷ 6 = 8.17
Variance	$\sigma_M^{\ 2} = \sum D_M^{\ 2} \div n$ = 234/6 = 39	$\sigma_B^{\ 2} = \sum D_B^{\ 2} \div n$ = 563/6 = 98.83
Standard Deviation	$\sigma_M = \sqrt{39}$ = 6.24	$\sigma_B = \sqrt{93.83}$ = 9.69

Covariance and Correlation:

Combination	Market and Security B
Covariance	$Cov_{MB} = \sum [D_M \times D_B] \div n = 308 \div 6 = 51.33$
Beta	$\beta = Cov_{MB} \div \sigma_M^{\ 2} = 51.33 \div 39 = 1.32$
Correlation	$\rho_{MB} = \frac{Cov_{MB}}{\sigma_M \times \sigma_B} = \frac{51.33}{6.24 \times 9.69} = 0.8489$

2. Computation of Characteristic Line for Security B

Particulars	Value
$Y = \bar{R}_B$	8.17
β	1.32
$X = \bar{R}_M$ (Expected Return on Market Index)	6

Characteristic Line for Security B = y = α + βx

8.17 = α + 1.32 x 6

α = 8.17 – 7.92 = 0.25

Characteristic line for Security y = 0.25 + 1.32x

3. Analysis of Risk into Systematic Risk and Unsystematic Risk

Particulars	Variance Approach	Standard Deviation Approach
Total Risk	66.75%	8.17%
Systematic Risk	Total risk x ρ_{MA}^2 = 66.75 x 0.8489^2= 48.102%	Total risk x ρ_{MA} = 9.69 x 0.8489= 8.23%
Unsystematic Risk	Total risk x $(1 - \rho_{MB}^2)$ = 66.75 x $(1-0.8489^2)$=18.6479	Total risk x $(1 - \rho_{MB})$ = 9.69 X (1 – 0.8489) = 1.4642

b)

We may treat the existing Co and new project as to two securities Portfolio since we are aware that original company has 0.75 share and new project 0.25 finally in overall operation.

1. Expected return = Proportion of Investment x Return

   = (0.75X14%) + (0.25x18%) = 15%

2. Covariance = ρAB (Correlation between old and new operations) X $\sigma_{\text{old project}}$ x $\sigma_{\text{new project}}$ = 0.25 x 20 x 32= 160

$$\sigma\rho = \sqrt{\left(\sigma A^2 \times W_A^{\ 2}\right) + \left(\sigma B^2 \times W_B^{\ 2}\right) + 2\left(\sigma A \times W_A \times \sigma B \times W_B \times \rho AB\right)}$$

   Variance of the company with new project = $(0.75^2 \times 20^2) + (0.25^2 \times 32^2) + (2 \times 0.75 \times 0.25 \times 160) = 349$

   S.D. = $\sigma = \sqrt{349} = 18.68\%$

3. Share holders utility without the project = $100 \times 12 - 20^2 = 800$ units
4. Shareholders utility with the project = $100 \times 13 - (18.68)^2 = 951$ units

Hence, project will increase the utility.

21.

a) The historical rates of return of two securities over the past ten years are given.

Calculate the Covariance and the Correlation coefficient of the two securities;

Years	1	2	3	4	5	6	7	8	9	10
Security A : (Return %)	12	8	7	14	16	15	18	20	16	22
Security B: (Return %)	20	22	24	18	15	20	24			

b) Write down the objectives of portfolio management?

Answer:

a)

1. Computation of Factors

	Return of	Deviation from	Variance of	Covariance

			Mean				of
Year	**Security A (R_1)**	**Security B (R_2)**	**SA $(R_1-\overline{R}_1)$ (D_1)**	**SB $(R_2-\overline{R}_2)$ (D_2)**	**(D_1^2)**	**(D_2^2)**	**R_1 &R_2 [D_1 X D_2]**
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1	12	20	-2.8	-1	7.84	1	2.8
2	8	22	-6.8	1	46.24	1	-6.8
3	7	24	-7.8	3	60.84	9	-23.4
4	14	18	-0.8	-3	0.64	9	2.4
5	16	15	1.2	-6	1.44	36	-7.2
6	15	20	0.2	-1	0.04	1	-0.2
7	18	24	3.2	3	10.24	9	9.6
8	20	25	5.2	4	27.04	16	20.8
9	16	24	1.2	3	1.44	9	3.6
10	22	18	7.2	-3	51.84	9	-21.6
	$\sum R_1$=148	$\sum R_2$ = 210			207.6	100	-20

	Security A	Security B
Mean	$\overline{R_1} = \sum R_1 \div n = 148 \div 10 = 14.8$	$\overline{R_2} = \sum R_2 \div n = 210 \div 10 = 21$
Variance	$\sigma_1^2 = \sum D_1^2 \div n = 207.6/10 = 20.76$	$\sigma_2^2 = \sum D_2^2 \div n = 100/10 = 10$
Standard Deviation	$\sigma_1 = \sqrt{20.76} = 4.55$	$\sigma_2 = \sqrt{10} = 3.162$

2. Covariance and Correlation:

Combination	**Security A and B**
Covariance	$Cov_{AB} = \sum [D_1 \times D_2] \div n = -20 \div 10 = -2$
Correlation	ρ_{AB} = Cov $_{AB}$ /(σ_A x σ_B)= -2 /(4.55 x 3.162) = - 0.1390

b) The objectives of Portfolio management are —

i) **Reduce Risk:** To reduce the risk of loss of capital / income, by investing in various types of securities and over a wide range of industries, i.e. diversification.

ii) **Safety of Principal:** To keep the capital / principal amount intact, in terms of value and in terms of purchasing power. The capital or the principal amount invested should not erode, either in value or in terms of purchasing power. By earning return, principal amount will not erode in nominal terms, by earning returns at a rate not lesser than the inflation rate; principal amount will be intact in present value terms.

iii) **Stability of Income:** To facilitate a more accurate and systematic re-investment of income, to ensure growth and stability in returns.

iv) **Capital Growth:** To enable attainment of capital growth by reinvesting in growth securities or through purchase of growth securities.

v) **Marketability:** To have an easily marketable investment portfolio, so that the investor is able to take advantage of attractive opportunities in the market.

vi) **Liquidity:** Some investors prefer that the portfolio should be such that whenever they need their money, they may get the same.

vii) **Maintaining the Purchasing Power**: Inflation eats the value of money, i.e., purchasing power. Hence, one object of the portfolio is that it must ensure maintaining the purchasing power of the investor intact besides providing the return.

viii) **Tax Savings:** To effectively plan for and reduce the tax burden on income, so that the investor gets maximum from his investment.

22.

a) Stock P has a Beta of 1.50 and a market expectation of 15% return. For Stock Q, it is 0.80 and 12.5% respectively. If the risk free rate is 6% and the market risk premium is 7%, evaluate whether these two stocks are priced correctly? I these two stocks to be regarded as correctly priced, what should the risk free rate and market risk premium be?

b) What are the weaknesses of technical analysis? Explain the differences of Security Market Line (SML) and Characteristic Line.

Answer:

a)

1. Expected Return [E(R)] under CAPM

Expected Return of Stock X $[E(R_x)] = R_F + \beta_x X [E(R_M) - R_F]$

Risk Free Return $[R_F]$ = 6%

Risk Premium $[E(R_M) - R_F]$ = 7%

Beta of Stock P$[\beta_P]$ = 1.50

Beta of Stock Q$[\beta_Q]$ = 0.80

Stock P $[E(R_P)]$ $= R_F + \beta_P \times [E(R_M) - R_F]$

= 6% + 1.50 x 7% = 6% + 10.50% = 16.50%

Stock Q [E (R_Q)] = $R_F + \beta_Q$ X [E (R_M) - R_F]

= 6% + 0.80 x 7% = 6% + 5.60% = 11.30%

2. Evaluation of Market Price

Particulars	Stock P	Stock Q
Expected Return (Market) **[A]**	15.00%	12.50%
Expected Return under CAPM **[B]**	16.50%	11.30%
Market Expectations [A] vs. CAPM Return [B]	[B] is Higher	[B] is Lower
Inference	Stock P gives lesser return than what it should give	Stock Q gives higher return than what it should give
Conclusion	Stock P is **Overvalued**	Stock P is **Undervalued**
Recommendation	**SELL**	**BUY**

3. Determination of Risk Free Return

Alternative 1

Let, Risk free return = R_F

Market Risk Premium = RP

For security P, under CAPM

15% = R_F + 1.5 X RP

RF = 15 – 1.5 RP (1)

For security Q, Under CAPM

12.5 = R_F + 0.80 RP

R_F = 12.5 – 0.80 RP (2)

R_F determined under equation (1) and equation (2) should be equal. Therefore,

15 – 1.5 RP = 12.5 – 0.80 RP

15 – 12.5 = 1.5 RP – 0.80 RP

2.5 = 0.7 RP

RP = 2.5/0.7 = 3.57%

Using RP = 3.57%, in equation (1)

R_F = 15 – 1.5 X 3.57

= 9.64%

Alternative 2:

Rule: If the stocks are correctly priced, then the Risk - Return Ratio should be the same i.e.,

$(R_P - R_F \div \beta_P) = (R_Q - R_F \div \beta_Q)$

$$\frac{15 - R_F}{1.5} = \frac{12.5 - R_F}{0.80}$$

$1.5(12.5 - R_F) = 0.80\ (15 - R_F)$

$18.75 - 1.5\ R_F = 12 - 0.80\ R_F$

$18.75 - 12 = 1.5\ R_F - 0.80\ R_F$

$6.75 = 0.7\ R_F$

$R_F = 9.64\%$

Market Risk Premium $= (R_P - R_F) \div \beta_P$

$= (15 - 9.64) \div 1.5 = 3.57\%$.

b) Weaknesses of Technical Analysis

Analyst Bias

Just as with fundamental analysis, technical analysis is subjective and our personal biases can be reflected in the analysis. It is important to be aware of these biases when analyzing a chart. If the analyst is a perpetual bull, then a bullish bias will overshadow the analysis. On the other hand, if the analyst is a disgruntled eternal bear, then the analysis will probably have a bearish tilt.

Open to Interpretation

Furthering the bias argument is the fact that technical analysis is open to interpretation. Even though there are standards, many times two technicians will look at the same chart and paint two different scenarios or see different patterns. Both will be able to come up with logical support and resistance levels as well as key breaks to justify their position. While this can be frustrating, it should be pointed out that technical analysis is more like an art than a science, somewhat like economics. Is the cup half-empty or half-full? It is in the eye of the beholder.

Too Late

Technical analysis has been criticized for being too late. By the time the trend is identified, a substantial portion of the move has already taken place. After such a large move, the reward to risk ratio is not great. Lateness is a particular criticism of Dow Theory.

Always another Level

Even after a new trend has been identified, there is always another "important" level close at hand. Technicians have been accused of sitting on the fence and never taking an unqualified stance. Even if they are bullish, there is always some indicator or some level that will qualify their opinion.

Trader's Remorse

Not all technical signals and patterns work. When you begin to study technical analysis, you will come across an array of patterns and indicators with rules to match. For instance: A sell signal is given when the neckline of a head and shoulders pattern is broken. Even though this is a rule, it is not steadfast and can be subject to other factors such as volume and momentum. In that same vein, what works for one particular stock may not work for another. A 50-day moving average may work great to identify support and resistance for IBM, but a 70-day moving average may work better for Yahoo. Even though many principles of technical analysis are universal, each security will have its own idiosyncrasies.

Technical analysts consider the market to be 80% psychological and 20% logical. Fundamental analysts consider the market to be 20% psychological and 80% logical. Psychological or logical may be open for debate, but there is no questioning the current price of a security. After all, it is available for all to see and nobody doubts its legitimacy. The price set by the market reflects

the sum knowledge of all participants, and we are not dealing with lightweights here. These participants have considered (discounted) everything under the sun and settled on a price to buy or sell. These are the forces of supply and demand at work. By examining price action to determine which force is prevailing, technical analysis focuses directly on the bottom line: What is the price? Where has it been? Where is it going?

Even though there are some universal principles and rules that can be applied, it must be remembered that technical analysis is more an art form than a science. As an art form, it is subject to interpretation. However, it is also flexible in its approach and each investor should use only that which suits his or her style. Developing a style takes time, effort and dedication, but the rewards can be significant.

Distinguish between a Security Market Line (SML) and Characteristic Line

Aspect	Security Market Line	Characteristic Line
Scheme	It represents the relationship between return and risk (measured in terms of systematic risk) of a security or portfolio.	It represents the relationship between the returns of two securities or a security and the market return, over a period of time.
Nature of Graph	Security Market Line is a cross-sectional graph.	Security Characteristic Line is a Time Series Graph.
Comparison	Security Market Line graphs beta versus expected return.	Characteristic Line graphs time series of Security Returns versus the Index Returns.
Utility	It is used for estimating the expected return for a security relative to its beta risk.	To estimate beta and also to determine how a security return correlates to a market index return.

23.

i. **What are the differences between Security Market Line and capital Market Line?**

ii. **Somnath Clothing Mills (SCM) is planning to foray into the business of establishing and running malls all around India, as it sees tremendous opportunity in that area. Presently, only one Company (OSS Bazaar Ltd) is in that line, establishing malls of size comparable to SCM proposed malls.**

The cost of establishing a single mall, on an average, works out to ₹135 Crores. It has ascertained the estimated operating cash inflows from each of those malls.

SCM's share is quoted at ₹540, its equilibrium price, for a return of ₹81 (for both Dividends and Capital Appreciation). SCM's share has a Beta of 1.50. Its Capital Structure is 40% Equity: 60% Debt, and applies this measure to each of its projects / business. Average Tax rate as applicable to SCM is 35%.

Particulars relating to OSS Bazaar Ltd are — (a) Equity Beta of 1.85; (b) Capital for its projects financed 40% by Debt; (c) Effective Tax Rate - 20% [Government has provided tax sops to companies engaged in establishing malls]

The Company's management is at a loss as to what discount rate should be applied for undertaking a financial feasibility study. Recommend the appropriate discount rate if the Risk Free Rate of Return is 6%, Cost of Debt is 10% (not carrying any risk factor).

Answer:

a)

Aspect	Capital Market Line	Security Market Line
1.Risk Considered	Capital Market Line uses Standard Deviation, i.e. Total Risks across the x-axis.	Security Market Line uses Beta or Systematic Risk across the x-axis. (i.e. that part of Total Risk which is common to the whole of market).
2.Nature of Portfolios	It uses only efficient portfolios, i.e. one which is a perfect replication of the Market Portfolio in terms of risks and rewards.	Security Market Line uses both efficient and non-efficient portfolios.
3.Combination	Every point on the Capital Market Line is a proportional combination between Risk free Rate of Return and Market Return.	It graphs all portfolios and securities which he on and off the Capital Market Line.

b) Flow:

- Calculation of Project Beta based on particulars of OSS Bazaar
- Project Beta of OSS Bazaar = Project Beta of SCM's Mall Business
- Ascertain Equity Beta of Mall Business.
- Ascertain Expected Equity Return of SCM on Mall Business
- Calculated Weighted Average Cost of Capital of Mall Business.

1. Calculation of Project Beta (Beta of Mall Business)

Note: For Computing Project Beta, beta of a comparable project only should be considered. Therefore, Beta of Mall Business of SCM should be ascertained from the figures of OSS Bazaar Ltd and not the particulars of SCM's Clothing Mill Business.

i) **Beta of OSS Ltd**

Beta of Mall Business β_{MALL} = Beta of OSS Bazaar Ltd (β_{oss})

β_{oss} = Weighted Average Beta of Equity and Debt

$\beta_{oss} = \beta_{oss\ -\ equity}$ X Equity ÷ [Equity + Debt X (1 - Tax Rate)]

$\beta_{oss\ -\ equity}$ = 1.85

Debt = 40% of Value = 0.40

Equity = 1 - Debt = 1 - 0.40 = 0.60

Beta of Debt β_D = 0 (Debt does not carry any Risk).

Tax Rate = 20% = 0.20

1 - Tax = 1 - 0.20 = 0.80

Therefore, β_{oss} = $\beta_{oss\ -\ equity}$ X Equity ÷ [Equity + Debt x (1 – Tax Rate)] + 0

= 1.85 x 0.60 ÷ [0.60 + (0.40 x 0.80)]

= 1.11 ÷[0.60 + 0.32]

= 1.11 ÷ 0.92 = 1.207

ii) **Beta of Mall Business**

$\beta_{MALL} = \beta_{OSS}$

Therefore, Beta of Mall Business (β_{MALL}) = 1.207

2. Calculation of Equity Beta of SCM's Mall Business

β_{MALL}	= $\beta_{SCM-EQUITY}$ X Equity ÷ [Equity + Debt x (1 – Tax Rate)] + 0
β_{MALL}	= 1.207
Debt	= 60% of Value = 0.60
Equity	= 40% of Value = 0.40
Tax Rate	= 20% = 0.20
1-Tax	= 1 - 0.20 - 0.80
1.207	= $\beta_{SCM-EQUITY}$ X 0.40 ÷ [0.40 + (0.60 X 0.80)]
	= $\beta_{SCM-EQUITY}$ X 0.40 ÷ [0.40 + 0.48]
	= $\beta_{SCM-EQUITY}$ X 0.40 ÷ 0.88
	= $\beta_{SCM-EQUITY}$ X 0.455
$\beta_{SCM-EQUITY}$	= 1.207 ÷ 0.455 = 2.65

3. Calculation of Equity Expected Return [$R_{E-SCM-MALL}$] on SCM's Mall Business (Under CAPM)

i) **Calculation of Equity Return of SCM's Cloth Business under CAPM [$E(R_{E-SCM-CLOTH})$]**

Particulars	Value
Return on Equity of SCM's Cloth Business	₹81
Market Price of Equity Share of SCM	₹540
Return on Equity Share of SCM [₹81 ÷ ₹540]	15%
Since Market Price is in Equilibrium, Expected Return under CAPM = Actual Return	15%

ii) **Calculation of Market Return [R_M]**

Expected Return under CAPM [$E(R_{E-SCM-CLOTH})$] = R_F + [$\beta_{E-SCM-CLOTH}$ x (R_M – R_F)

15%	= 6% + 1.50 x (R_M - 6%)
15% - 6%	= 1.50 x (R_M - 6%)
R_M - 6%	= 9% ÷ 1.50
R_M	= 6% + 6% = 12%

iii) **Calculation of Equity Expected Return on SCM's Mall Business [$R_{E\text{-}SCM\text{-}MALL}$]**

Expected Return under CAPM [$E(R_{E\text{-}SCM\text{-}MALL})$] = $R_F + [\beta_{E\text{-}SCM\text{-}MALL}] \times (R_M - R_F)$]

= $E(R_{E\text{-}SCM\text{-}MALL})$ = 6% + 2.65 x (12% - 6%)

= 6% + 2.65 x 6%

= 21.90%

4. Calculation of Weighted Average Cost of Capital of SCM's Mall Business

Source of Fund	Weight	Cost [Net of Tax]	Weighted Cost
(1)	**(2)**	**(3)**	**(4) = (2)X(3)**
Debt	0.60	8% [10% x (1- Tax 20%) = 10% x 0.80]	4.80%
Equity	0.40	21.90%	8.76%
	1.00	Weighted Average Cost of Capital	13.56%

Conclusion: Appropriate Discount Rate for evaluating the financial feasibility of the project is the Weighted Average Cost of Capital of 13.56**%.**

Section – D

24.

a) Excel Ltd. manufactures a special chemical for sale at ₹ 40 per kg. The variable cost of manufacture is ₹ 25 per kg. Fixed cost excluding depreciation is ₹ 2,50,000. Excel Ltd. is currently operating at 50% capacity. It can produce a maximum of 1,00,000 kgs at full capacity.

The Production Manager suggests that if the existing machines are fully replaced the company can achieve maximum capacity in the next five years gradually increasing the production by 10% per year. The Finance Manager estimates that for each 10% increase in capacity, the additional increase in fixed cost will be ₹ 50,000. The existing machines with a current book value of ₹ 10,00,000 can be disposed of for ₹ 5,00,000. The Vice-President (finance) is willing to replace the existing machines provided the NPV on replacement is about ₹ 4,53,000 at 15% cost of capital after tax.

(i) You are required to compute the total value of machines necessary for replacement.

For your exercise you may assume the following:

a. **The company follows the block assets concept and all the assets are in the same block. Depreciation will be on straight-line basis and the same basis is allowed for tax purposes.**
b. **There will be no salvage value for the machines newly purchased. The entire cost of the assets will be depreciated over five year period.**
c. **Tax rate is at 40%.**
d. **Cash inflows will arise at the end of the year.**
e. **Replacement outflow will be at the beginning of the year (year 0).**

f.

Year	0	1	2	3	4	5
Discount Factor at 15%	1	0.87	0.76	0.66	0.57	0.49

(ii) On the basis of data given above, the managing director feels that the replacement, if carried out, would at least yield post tax return of 15% in the three years provided the capacity build up is 60%, 80% and 100% respectively. Do you agree?

b) Explain the main causes of uncertainty?

Answer:

a)

i) Computation of the total replacement value of machine. (Assuming that existing machines also have valid life for 5 years

Step 1: Incremental Cash Inflows

Year	1	2	3	4	5
Incremental Capacity	10%	20%	30%	40%	50%
Incremental production and sales (Kgs.)	10,000	0,000	30,000	40,000	50,000
	₹	₹	₹	₹	₹
Incremental contribution	1,50,000	3,00,000	4,50,000	6,00,000	7,50,000
Incremental Fixed cost	50,000	1,00,000	1,50,000	2,00,000	2,50,000
Incremental PBTD	1,00,000	2,00,000	3,00,000	4,00,000	5,00,000
Tax at 40%	40,000	80,000	1,20,000	1,60,000	2,00,000
Incremental PAT BD	60,000	1,20,000	1,80,000	2,40,000	3,00,000
Discount factors	0.87	0.76	0.66	0.57	0.49
Discounted value of PAT BD	52,200	91,200	1,18,800	1,36,800	1,47,000
Total for 5 years	5,46,000				

Step 2: Incremental Cash outflow

Let the total cost of replacement	X
Disposal value of existing machines	5,00,000

Incremental cash outflow	(X – 5,00,000)

Step 3: Tax savings on depreciation

= (Incremental block/5) x Tax rate x (Annuity factor of 15% for 5 years)

= [(X – 5,00,000)/5] x 40% x 3.35 = 0.268 x - 1,34,000

Step 4: Total Discounted cash inflows

Total incremental discounted cash inflows: 5,46,000 + .268X – 1,34,000 = 4,12,000 + .268 X

Step 5: Equation

NPV = Sum of discounted cash inflows – Sum of the discounted cash outflows

4, 53,000 = (4, 12,000 + .268 X) – (X – 5, 00,000)

4, 53,000 = 4, 12,000 + .268 X – X + 5,00,000

4, 53,000 - 4, 12,000 - 5, 00,000 = .268 X – X

- 4,59,000 = -0.732 X

Or 0.732 X = 4,59,000

Or X = 4,59,000/0.732 = ₹ 6,27,049

ii) Evaluation whether replacement would yield post tax return of 15% in 3 years

	1	2	3
Incremental capacity	10%	30%	50%
Incremental PBTD	1,00,000	3,00,000	5,00,000
Depreciation (6,27,049 – 5,00,000)/5	25,410	25,410	25,410
Incremental PBT	74,590	2,74,590	4,74,590
Tax at 40%	29,836	1,09,836	1,89,836
Incremental PAT	44,754	1,64,754	2,84,754
PAT + Depreciation	70,164	1,90,164	3,10,164
Discount factors	0.87	0.76	0.66
Discounted cash inflows	61,043	1,44,525	2,04,708
Total discounted cash inflow	4,10,276		
Discounted incremental cash outflow	1,27,049		
NPV	2,83,227		

Conclusion: As the net present value is positive the view of the Managing Director is correct.

b) Uncertainty usually arises because it is impossible to predict the different variables and, consequently, the magnitudes of benefits and costs exactly as they will occur One hundred per cent predictability in project analysis is not feasible for many reasons, the most important being

i) Inflation, by which it is understood that the prices of most items, inputs or outputs, increase with time, causing changes in relative prices The exact magnitude of price increases will always be unknown Prices may change upwards or downwards for other reasons, too,

ii) Changes in technology quantities and qualities of inputs and outputs used for project evaluation are estimated according to the present state of knowledge, yet new technologies might be introduced in the future that would alter these estimates,

iii) The rated capacity used in project evaluation may never be attained This in turn will affect operating costs as well as sales revenue,

iv) It often turns out that the needed investment for both fixed and working capital is underestimated and that the construction and running-in periods are considerably longer than expected This affects the size of investment, operating costs and sales revenue

Some uncertainties are outside the control of planners, others can be influenced by their policies. The extent of risk associated with an investment project may be reduced either by making advance arrangements for dealing with uncertainty or by substituting a less risky alternative for a more risky one.

25.

a) Jemini Ltd. is in the business of manufacturing bearings. Some more product lines are being planned to be added to the existing system. The machinery required may be bought or may be taken on lease. The cost of machine is ₹ 40,00,000 having a useful life of 5 years with the salvage value of ₹ 8,00,000. The full purchase value of machine can be financed by 20% loan repayable in five equal instalments falling due at the end of each year. Alternatively, the machine can be procured on a 5 years lease, year-end lease rentals being ₹ 12,00,000 per annum. The Company follows the written down value method of depreciation at the rate of 25%. Company's tax rate is 35 per cent and cost of capital is 16 per cent:

i) Advise the company which option it should choose – lease or borrow.

ii) Assess the proposal from the lessor's point of view examining whether leasing the machine is financially viable at 15% cost of capital (Detailed working notes should be given. Calculations can be rounded off to ₹ lakhs).

b) Define Project Report. Write down the silent features of a project report?

Answer:

a)

(i) P.V. of Cash outflow under lease option (in ₹)

Year	Lease Rental after tax	PVIFA @ 13%	Total P.V.
1 – 5	12,00,000 (I – T)	20% (I – T)	
	= 7,80,000	3.517	27,43,260

Cash Outflow under borrowing option

5 equal instalments

₹ 40,00,000 ÷ 2.991 (PVIFA 20%) = 13,37,345

Tax Savings

Year	Loan Instalments	On Interest	On Depreciation	Net Cash Outflow	PVIF 13%	Total PV
1	13,37,345	2,80,000	3,50,000	7,07,345	0.885	6,26,000
2	13,37,345	2,48,386	2,62,500	8,26,459	0.783	6,47,117
3	13,37,345	1,97,249	1,96,875	9,43,221	0.693	6,53,652
4	13,37,345	1,43,085	1,47,656	10,46,604	0.613	6,41,568
5	13,37,345	78,087	1,10,742	11,48,516	0.543	6,23,644
Tatal PV						31,91,981
Less: PV Salvage value adjusted for Tax savings on loss of sale of machinery (₹ 8,00,000 × .543 = ₹ 4,34,400) + (₹ 28,359) (See Working Note on Depreciation) 9,49,219 – 8,00,000 =1,49,219 ×0 .35 × 0.543 = 28,359						(4,62,759)
Total present value of cash outflow						27,29,222

Decision: PV of cash outflow of lease option is greater than borrow option and hence borrow option is recommended.

Working Notes:

1. Debt and Interest Payments

Year	Loan Instalments	Loan at the beginning of the year	Interest	Principal	Balance at the end of year
1	13,37,345	40,00,000	8,00,000	5,37,345	34,62,655
2	13,37,345	34,62,655	6,92,531	6,44,814	28,17,841
3	13,37,345	28,17,841	5,63,568	7,73,777	20,44,064
4	13,37,345	20,44,064	4,08,813	9,28,532	11,15,532
5	13,37,345	11,15,532	2,23,106	11,14,239	Nil

2. calculation of Depreciation

Year		Depreciation
1	40,00,000 ×0 .25	10,00,000

2	30,00,000 × 0.25	7,50,000
3	22,50,000 × 0.25	5,62,500
4	16,87,500 ×0 .25	4,21,875
5	12,65,625 × 0.25	3,16,406

W.D.V. of machine = 12,65,625 – 3,16,406 = 9,49,219.

(ii) Proposal from the Lessor's point of view

Lessor's Cash Flow

	1	2	3	4	5
Lease Rentals	12,00,000	12,00,000	12,00,000	12,00,000	12,00,000
Less: Dep.	10,00,000	7,50,000	5,62,500	4,21,875	3,16,406
EBT	2,00,000	4,50,000	6,37,500	7,78,125	8,83,594
Less: Tax @ 35%	70,000	1,57,500	2,23,125	2,72,344	3,09,258
EAT	1,30,000	2,92,500	4,14,375	5,05,781	5,74,336
CFAT	11,30,000	10,42,500	9,76,875	9,27,656	8,90,742
PV factor @ 15%	0.8696	0.7561	0.6575	0.5717	0.4972
PV	9,82,648	7,88,234	6,42,295	5,30,341	4,43,144

Total P.V.	= 33, 86,662
Add: Tax Saving on sale of asset	= 25,967 (1, 49,219 x 0.35 x 0.4972)
Total PV of cash inflow	34, 12,629
less : Cost of Machine	40,00,000
NPV	(5,87,371)

Decision: Lease rate is not financially viable. Hence, not recommended.

b) Project Report or Feasibility Report is a written account of various activities to be undertaken by a Firm and their technical, financial, commercial and social viabilities.

Purpose: Project Report states as to what business is intended to be undertaken by the entrepreneur and whether it would be technically possible, financially viable, commercially profitable and socially desirable to do such a business.

Features of a Project Report

i) **Technical Feasibility:**

This includes analysis about the technical requirements of the industry in relation to the project in hand and involves a examination of issues like suitability of plant location, adoption of appropriate technology, selection of machinery and plant etc.

ii) **Economic, Financial and Commercial Viability:**

- Economic Viability is concerned with a thorough analysis of present and future market prospects for the proposed product and involves the study of possible competitors in the market and the firm's relative cost advantages and disadvantages in relation to them.
- Financial Viability includes estimation of capital requirements and its cost, computation of operating costs, forecasting of sales revenue, arrangement of credit, measurement of profit, finding out the break-even points, assessment of fixed and variable costs, cash flow estimates, etc.
- Commercial Viability includes the estimation of the selling problems and profitability of the project. A project must, therefore, be economically, financially and commercially viable.

iii) **Social Viability:**

- Business entities depend heavily on specialized Financial Institutions, funded or approved by Government, for procuring finance, Government or its agencies would extend assistance to a business unit only if the proposed project is socially desirable.
- Social viability becomes necessary for performing the social responsibilities of the Firm. Therefore, at the time of preparing the project report, the social benefits of the project must be analyzed well.

26.

a) A firm has an investment proposal, requiring an outlay of ₹ 80,000. The investment proposal is expected to have two years economic life with no salvage value. In year 1, there is a 0.4 probability that cash inflow after tax will be ₹ 50,000 and 0.6 probability that cash inflow after tax will be ₹ 60,000. The probability assigned to cash inflow after tax for the year 2 are as follows:

The cash inflow year 1	**₹ 50,000**		**₹ 60,000**	
The cash inflow year 2	**Probability**		**Probability**	
	₹ 24,000	**0.2**	**₹ 40,000**	**0.4**
	₹ 32,000	**0.3**	**₹ 50,000**	**0.5**
	₹ 44,000	**0.5**	**₹ 60,000**	**0.1**

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

Required:

i) Construct a decision tree for the proposed investment project and calculate the expected net present value (NPV).

ii) What net present value will the project yield, if worst outcome is realized? What is the probability of occurrence of this NPV?

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

iv) Will the project be accepted?

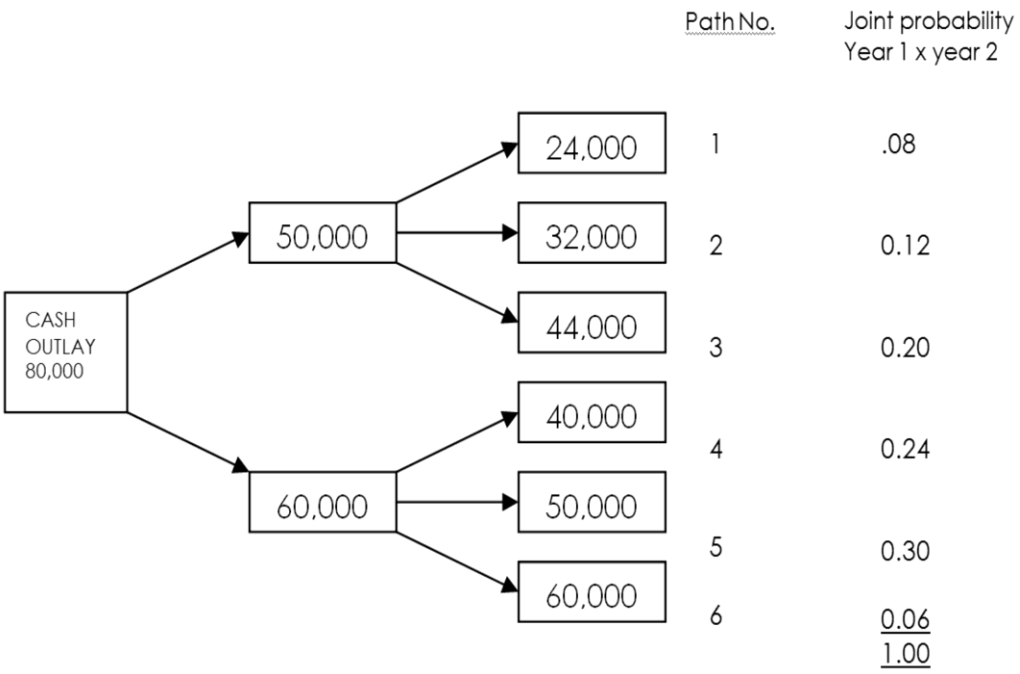
(Note: 8% discount factor 1 year 0.9259; 2 year 0.8573)

b) What are the differences between NPV and IRR?

Answer:

a)

i) The decision tree diagram is presented in the chart, identifying various paths and outcomes, and the computation of various paths/outcomes and NPV of each path are presented in the following tables:



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

Path	Year 1 Cash Flows (₹)	Year 2 Cash Flows (₹)	Total Cash Inflows (PV) (₹)	Cash Inflows (₹)	NPV (₹)
1	50,000×0.9259= 46,295	24,000×0.8573= 20,575	66,870	80,000	(—) 13,130
2	46,295	32,000×0.8573= 27,434	73,729	80,000	(—) 6,271
3	46,295	44,000×0.8573= 37,721	84,016	80,000	4,016
4	60,000×0.9259= 55,554	40,000×0.8573= 34,292	89,846	80,000	9,846
5	55,554	50,000×0.8573= 42,865	98,419	80,000	18,419
6	55,554	60,000×0.8573= 51,438	1,06,992	80,000	26,992

Statement showing Expected Net Present Value

₹

z	NPV(₹)	Joint Probability	Expected NPV
1	(—) 13,130	0.08	—1,050.40
2	(—) 6,271	0.12	—752.52
3	4,016	0.20	803.20
4	9,846	0.24	2,363.04
5	18,419	0.30	5,525.70
6	26,992	0.06	1,619.52
			8,508.54

Conclusions:

ii) If the worst outcome is realized the project will yield NPV of – ₹ 13,130. The probability of occurrence of this NPV is 8% and a loss of ₹ 1,050.40 (path 1).

iii) The best outcome will be path 5 when the NPV is at ₹ 18,419. The probability of occurrence of this NPV is 30% and a expected profit of ₹ 5,525.70.

iv) The project should be accepted because the expected NPV is positive at ₹ 8,508.54 based on joint probability.

b) Difference between NPV and IRR

(a) 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 points 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 later years' CFAT. A project with heavy initial CFAT than compared to later years will have higher IRR and vice-versa.

(b) Superiority of NPV: In case of conflicting decisions based on NPV and IRR, the NPV method must prevail. Decisions are based on NPV, due to the comparative superiority of NPV, as given from the following points –

i) NPV represents the surplus from the project but IRR represents the point of no surplus-no deficit.
ii) NPV considers Cost of Capital as constant. Under IRR, the Discount Rate is determined by reverse working, by setting NPV = 0.
iii) NPV aids decision-making by itself i.e. projects with positive NPV are accepted. IRR by itself does not aid decision-making. For example, a project with IRR = 18% will be accepted if K_0 < 18%. However, the project will be rejected if K_O = 21% (say > 18%).
iv) NPV method considers the timing differences in Cash Flows at the appropriate discount rate. IRR is greatly affected by the volatility / variance in Cash Flow

patterns.

v) IRR presumes that intermediate cash inflows will be reinvested at that rate (IRR), whereas in the case of NPV method, intermediate cash inflows are presumed to be reinvested at the cut-off rate. The latter presumption viz. Reinvestment at the Cut-Off Rate, is more realistic than reinvestment at IRR.

vi) There may be projects with negative IRR/ Multiple IRR etc. if cash outflows arise at different points of time. This leads to difficulty in interpretation. NPV does not pose such interpretation problems.

27.

a) Write down the steps in financial planning process? Define cross border leasing. Mention the objectives of cross border leasing.

b) The R & G Co. has following capital structure at 31st March 2013, which is considered to be optimum -

Particulars	Amount (in ₹)
13% Debentures	3,60,000
11% Preference share Capital	1,20,000
Equity Share Capital (2,00,000 Shares)	19,20,000

The Company's Share has a current Market Price of ₹ 27.75 per Share. The expected Dividend per Share in the next year is 50 percent of the 2008 EPS. The EPS of last 10 years is as follows. The past trends are expected to continue -

Year	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
EPS(₹)	1.00	1.120	1.254	1.405	1.574	1.762	1.974	2.211	2.476	2.773

The company can Issue 14 percent New Debenture. The Company's Debenture is currently selling at ₹ 98. The New Preference Issue can be sold at a net price of ₹ 9.80, paying a dividend of ₹1.20 per share. The Company's marginal tax rate is 50%.

1. **Calculate the After Tax Cost (a) of new Debt and new Preference Share Capital, (b) of ordinary Equity, assuming new Equity comes from Retained Earnings.**
2. **Calculate the Marginal Cost of Capital.**
3. **How much can be spent for Capital Investment before new ordinary share must be sold? Assuming that retained earnings available for next year's Investment are 50% of 2004 earnings.**
4. **What will be Marginal Cost of Capital(cost of fund raised in excess of the amount calculated in part (3) if the Company can sell new ordinary shares to net ` 20 per share? The cost of Debt and of Preference Capital is constant.**

Answer:

a) The financial planning process involves the following steps:

i) **Clearly defined Mission and Goal —** At the outset, the top management should realize and recognize the importance of setting the organizational mission, goal and objectives, which should be clearly defined and communicated.

ii) **Determination of Financial Objectives —** In developing the financial objectives, a firm must consider its purpose, mission, goal and overall objectives of the firm. The financial objectives can again be transformed into strategic planning. The financial objectives can be classified into: (a) long-term objectives, and (b) short-term objective. The long-term financial objectives may relate to earnings in excess over the targeted return on capital employed, increase in EPS and market value of share, increase in market share of its product, achieve targeted growth rate in sales, maximization of value for shareholders *etc.* The short-term financial objectives relate to profitability, liquidity, working capital management, current ratio, operational efficiency etc.

iii) **Formulation of Financial Policies —** The next step in financial planning and decision making process is to formulate the financial policies which provide guides to decision making for attainment of both long-term and short-term financial objectives. For example, the company can frame its financial policies like:

a. Debt-equity ratio and current ratio of the firm may be fixed at 3:2 and 2:1 respectively.

b. A minimum cash balance has to be maintained at `1,00,000 always.

c. The minimum and maximum levels are to be fixed for all items of raw material and consumable.

d. The equity to be raised only by issue of equity shares.

e. Profitability centre concept to be implemented for all divisions in the organization.

f. The inter-divisional transfers to be priced at pre-determined transfer prices etc.

iv) **Designing Financial Procedures —** The financial procedures help the Finance manager in day to day functioning, by following the pre-determined procedures. The financial decisions are implemented to achieve the organizational goals and financial objectives. The financial procedures outline the cash flow control system, setting up of standards of performance, continuous evaluation process, capital budgeting procedures, capital expenditure authorization procedures, financial forecasting techniques to be used, preparation standard set of ratios, using of budgetary control system etc.

v) **Search for Opportunities —** This involves a continuous search for opportunities which are compatible with the firm's objectives. The earlier opportunity is identified the greater should be the potential returns before competitors and imitators react.

vi) **Identifying Possible Course of Action —** This requires the development of business strategies from which individual decisions emanate. The available courses of action should be identified keeping in view the marketing, financial and legal restrictions or other forces not within the control of decision maker. For example, the additional funds requirement for expansion of the plant can be met by raising of finances from various sources.

vii) **Screening of Alternatives —** Each course of action is subjected to preliminary screening process in order to assess its feasibility considering the resources required, expected returns and risks involved. Readily available information must be used to ascertain whether the course of action is compatible with existing business and corporate objectives and likely returns can compensate for the risks involved.

viii) **Assembling of Information —** The Finance manager must be able to recognize the information needs and sources of information relevant to the decision. The cost-benefit trade-off must be kept in view in information gathering. To obtain more reliable information, the costs may be heavy in data gathering. The relevant and reliable information ensures the correct decision making and confidence in the decision outcome.

ix) **Evaluation of Alternatives and Reaching a Decision —** This step will involve the evaluation of different alternatives and their possible outcomes. This involves comparing the options by using the relevant data in such a way as to identify the best possible course of action that can enable in achieving the corporate objectives in the light of prevailing circumstances.

x) **Implementation, Monitoring and Control —** After the course of decision is selected, attempts to be made to implement the decision to achieve the desired results. The progress of action should be continuously monitored by comparing the actual results with the desired results. The progress should be monitored with feedback reports, control reports, post audits, performance audits, progress reports etc. Any deviations from planned course of action should be rectified by making supplementary decisions.

Cross Border Leasing

Cross-border leasing is a leasing arrangement where lessor and lessee are situated in different countries. Cross-border leasing can be considered as an 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 of Cross Border Leasing:

i) **Overall Cost of Financing:** A major objective of cross-border leases is to reduce the overall cost of financing through utilization 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 utilize 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.

b) Computation of Cost of Additional Capital (component wise)

1. (a) After Tax Cost of New Debt	$\frac{\text{Interest} \times \text{TaxRate}}{\text{Net Proceeds of issue}} = \frac{14 \times 50\%}{105.54}$	= 6.63% **(Note 1)**
1. (a) After Tax Cost of New =Preference Share Capital	$\frac{\text{Preference Dividend}}{\text{Net Proceeds of issue}} = \frac{₹1.20}{₹9.80}$	= 12.24%
1. (b) After Tax Cost of Ordinary Equity	$(DPS + MPS) + g = \frac{(2.773 \times 50\%)}{27.75} + 12\%$	= 17.00% **(Note 2)**

Note 1: Since Current 13% Debenture is selling at ₹ 98 (₹100 presumed as Par Value), the Company can sell 14% New Debentures at (14%× 98) ÷ 13% = ₹105.54 approximately. Alternatively, K_d can also be computed as (₹14 × 50%) ÷ ₹ 98 = **7.14%.**

Note 2: For computing "**g**" i.e. Growth Rate under Realised Yield Method, the past average Growth Rate is at **12%**, in the following manner-

Year	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**
** EPS (₹)	1.00	1.120	1.254	1.405	1.574	1.762	1.974	2.211	2.476	2.773
Additional	—	0.120	0.134	0.151	0.169	0.188	0.212	0.237	0.265	0.297
Increase(%)	—	12.00	11.96	12.04	12.03	11.94	12.03	12.01	11.99	12.00

Note: % Increase in EPS = Additional EPS ÷ Previous Year EPS e.g. 0.120 ÷ 1.00 etc.

Marginal Cost of Capital: Since the present Capital Structure is optimum (*Refer 1st sentence in the)*, the additional funds will be raised in the same ratio in order to maintain the capital structure. Hence, Marginal Cost of Capital is **15.20%,** computed as under:

Component	**Amount**	**%**	**Individual**	**WACC**
Debt	3,60,000	15%	K_d = 6.63%	0.99%
Preference Capital	1,20,000	5%	K_p = 12.24%	0.61%
Equity Capital	19,20,000	80%	K_e = 17.00%	13.60%
Total	**24,00,000**	**100%**	**WACC = K_0 =**	**15.20%**

Note: When K_d is taken at 7.14%, K_o will be **15.28% .**

Retained Earnings available for further investments = 50% of 2008 EPS
= 50%× ₹ 2.773×2, 00,000 Shares
=**₹ 2, 77,300**

Hence, amount to be spent before selling new ordinary shares = ₹ 2, 77,300.

Since Equity is 80% of the total funds employed, the total capital before issuing fresh equity shares = ₹ 2, 77,300 ÷ 80% = **₹ 3, 46,625.**

Computation of Revised Marginal Cost of Capital if Equity Issue is made at ₹ 20 per share

Revised Cost of Ordinary Equity = (DPS ÷ MPS) +g = $\frac{2.773 \times 50\%}{27.75} + 12\%$ =18.30%

if MPS (i.e. Issue Price) = ₹ 20

Component	Amount	%	Individual	WACC
Debt	3,60,000	15%	K_d = 6.63%	0.99%
Preference Capital	1,20,000	5%	K_p = 12.24%	0.61%
Equity Capital	19,20,000	80%	K_e = 18.93%	15.15%
Total	**24,00,000**	**100%**	**WACC = K_0**	**16.75%**

Note: When K_d is taken at 7.14%, Revised K_o will be **16.82%.**

28.

a) What is the influence of corporate taxation on corporate financing? Mention the different methods of structuring a lease rental.

b) You are analyzing the beta for ABC Computers Ltd. and have dividend the Company into four broad business groups, with market values and betas for each group.

Business Group	Market value of Equity	Unleveraged beta
Main frames	**₹100 billion**	**1.10**
Personal Computers	**₹ 100 billion**	**1.50**
Software	**₹ 50 billion**	**2.00**
Printers	**₹ 150 billion**	**1.00**

ABC Computers Ltd. had ₹ 50 billion in debt outstanding.

Required:

1. Estimate the beta for ABC Computers Ltd. as a Company. Is this beta going to be equal to the beta estimated by regressing past returns on ABC Computers stock against a market index. Why or Why not?

2. **If the treasury bond rate is 7.5% estimate the cost of equity of ABC Computers Ltd. Estimate the cost of equity for each division. Which cost of equity would you use to value the printer division? The average market risk premium is 8.5%.**

Answer:

a) The influence of corporate taxation on corporate financing can be analysed in the following areas—

1. **Financing Decisions — Cost of Capital:** Debt is cheaper than Equity since interest payable on loan is a charge on profit and will reduce the tax payable by the company. The use of cheaper cost debt funds has a leverage effect and increases the EPS of the company.
2. **Investment Decisions — Capital Budgeting:** For project evaluation, the Cash Flows after Taxes (CFAT) are relevant for discounting purposes. Cash Outflows may also be reduced due 'to various deductions and allowances. The incidence of tax on income and on capital gains affects cash flows and investment decisions.
3. **Dividend Decisions — Retention vs. Payment:** Tax is one of the major considerations in taking decisions on the amount and rate of dividend. Whether the company should retain all its earnings or distribute ail earnings as dividend, also depends on tax incidence on the Company and its shareholders. The levy of taxes on dividends pushes the cost of equity capital of the company.
4. **Evaluation of Cash Flows:** Depreciation is not an outgo in cash but it is deductible in computing the income subject in tax. There will be saving in tax on depreciation, and such savings could be profitably employed. Thus, both interest and depreciation provide tax shield and have a tendency to increase EPS.
5. **Rehabilitation of Sick Units:** Unabsorbed Depreciation can be carried forward for 8 years, and this can be carried for set off in another Company's profit in case of amalgamations in specified circumstances. Such a provision will help in the growth of Companies and rehabilitation of sick units.
6. **Protection of Internal Funds:** Tax implications should be taken care off in choosing the size and nature of industry and incentives are given for backward areas. Tax considerations are relevant for purpose of preserving and protecting internal funds.

Different Methods of Structuring a Lease Rental

Structuring of a Lease Rental refers to the determination of the timing and the amount of lease rentals. Lease rentals are tailor-made to enable the lessee to pay from the funds generated from its operations. Lease rentals can be of the following types

(a) Equal Annual Plan: Here the lease rentals are charged equally throughout the period of the Lease.

(b) Deferred Lease Rentals: Here the rentals are structured in such a manner that there is a moratorium for an agreed initial period, so that the lease rentals can be paid as and when funds are generated from the operations of the lessee.

(c) Stepped up Lease Rentals: Here, there is a constant rate of increase in the amount of Lease Rentals charged throughout the period of lease.

(d) Balloon Lease Rentals: Here the lease rent is generally low throughout the lease, but a payment called as Balloon payment is required to be paid at a future date. This is a lump sum payment which seeks to cover the shortfall in the lease rentals collected each year. Subsequently, normal lease rentals are charged.

Example: If profits from the leased plant start from the third year and go on increasing, then lessee will structure the installments of the plant in such a way that he will pay more amounts in the 4th year and onwards i.e. Ballooned lease rentals.

b)

1. Computation of Company Bets:

Group	**Market value**	**Proportion**	**Unleveraged beta**	**Product beta**
Mainframe	₹100 billion	25%	1.10	0.275
Presonal Computer	₹100 billion	25%	1.50	0.375
Software	₹ 50 billion	12.5%	2.00	0.250
Printers	₹150 billion	37.5%	1.00	0.375
Total	**₹ 400 billion**	**100%**	**Unleveraged beta of portfolio**	**1.275**

Note: Beta measures the volatility of ABC Computers' stock returns against a broad-based market portfolio. In the above case, the beta is calculated for four business groups in a computer segment and not a broad-based market portfolio. Hence, beta calculations will not be the same, as such.

Beta of the Leveraged Firm B(L)=Beta of Unleveraged FirmB(U)×[(Equity+ Debt)÷Equity]

= 1.275 × [(400 + 50) ÷ 400]

= **1.434**

Market Index Relationship: This leveraged Beta of **1.434** will be equal to the Beta estimated by regressing returns on ABC Computers stock against a market index. The reasoning is as under-

1. The Beta of a security is a measure of return for the systematic risk of that security, relative to the market i.e. its Systematic Risk.
2. A portfolio generally consists of a well - diversified set of securities.
3. The Systematic Risk cannot be diversified away, and hence, the Beta of a portfolio is the **value - weighted beta** of the securities constituting the portfolio.
4. The Beta of a portfolio depicts the systematic Risk (i.e. Non-Diversifiable Risk) of the portfolio itself.
5. Cost of **Equity for ABC Computers** =Return of Risk Free Securities + (Market Risk premium × Beta) =7.50% + (8.50% × 1.434) = **19.69%**
6. **Cost of Equity for each Division**

Division	Cost of Equity for each Division = **Return of Risk Free Securities + (Market Risk premium × Beta)**
Mainframe	= 7.50% + (8.50% × 1.10) = 16.85%

Personal Computer	= 7.50% + (8.50% × 1.50) = 20.25%
Software	= 7.50% + (8.50% × 1.10) = 24.50%
Printers	= 7.50% + (8.50% × 1.00) = 16.00%

For valuing Printer Division, K_e of 16% would be used.

29.

a) What do you mean by global financial system (GFS)? Write down the regulations regarding portfolio investments by NRIs/ PIOs.

b) Elite Builders has been approached by a foreign embassy to build for it a block of six flats to be used as guest houses. As per the terms of the contract, the foreign embassy would provide Elite Builders the plans and the land costing `25 lakhs. Elite Builders would build the flats at their own cost and lease them to the foreign embassy for 15years. At the end of which the flats will be transferred tot the foreign embassy for a nominal value of ` 8 lakh. Elite Builders estimates the cost of constructions as follows:

Area per flat, 1,000 sq. feet ; Construction cost, ₹400 per sq. feet ; Registration and other costs, 2.5 per cent of cost of construction; Elite Builders will also incur ₹4 lakhs each in years 14 and 15 towards repairs.

Elite Builders proposes to charge the lease rentals as follows:

Years	Rentals
1 - 5	Normal
6 – 10	120 per cent of normal
11 - 15	150 per cent of normal

Elite builders present tax rate averages at 35 per cent which is likely to be the same in future. The full cost of construction and registration will be written off over 15 years at a uniform rate and will be allowed for tax purposes.

You are required to calculate the normal lease rental per annum per flat. For your exercise you may assume: (a) Minimum desired return of 10 per cent, (b) Rentals and repairs will arise on the last day of the year, and, (c) Construction, registration and other costs will be incurred at time= 0.

Answer:

a) A brief definition of the **global financial system** (**GFS**) is the financial system consisting 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 a multinational company.

Main Players

1. Global or international systemically important financial institutions, e.g., banks, hedge funds whose failure may cause a global financial 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 G20 major economies, finance ministries 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 systemic 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 U.S.A (the US agency 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.

Regulations Regarding Portfolio Investments by NRIs/PIOs

- Non- Resident Indian (NRIs) and Persons of Indian Origin (PIOs) can purchase or sell shares/ fully and mandatorily convertible debentures of Indian companies on the Stock Exchanges under the Portfolio Investment Scheme. For this purpose, the NRI/ PIO has to apply to a designated branch of a bank, which deals in Portfolio Investment. All sale/ purchase transactions are to be routed through the designated branch.
- An NRI or a PIO can purchase shares up to 5 per cent of the paid up capital of an Indian company. All NRIs/PIOs taken together cannot purchase more than 10 per cent of the paid up value of the company. This limit can be increased by the Indian company to 24 per cent by passing a General Body resolution. The Indian company has to intimate the raising of the NR Limit to the Reserve Bank to enable the Bank to notify the same on its website for larger public dissemination.
- The sale proceeds of the repatriable investments can be credited to the NRE/ NRO, etc. accounts of the NRI/ PIO, whereas the sale proceeds of non-repatriable investment can be credited only to NRO accounts.
- The sale of shares will be subject to payment of applicable taxes.

b)

Calculation of present value of Cash out flow: (₹)

Cost of construction 400x1,000x6		24,00,000
Registration and other costs @ 2.5%		60,000
Cost of Repairs	4,00,000	
(-) tax savings @ 35%	1,40,000	
	2,60,000	
At t_{14} = Present value = 2,60,000 x 0.26333 = 68466		

At t_{15} = present value = 2,60,000 x 0.23939 = 62241		
		1,30,707
		25,90,707 (Rounded of to 25,90,700)

Let 'X' be Normal lease rent per 6 flats per annum. P/V of Recurring Cash Inflow for 15 years

Particulars	**1-5 years**	**6-10 years**	**11-15 years**
Lease Rent p.a.	X	1.2 X	1.5 X
Depreciation	164,000	164,000	164,000
PBT 24,60,000/15	X-164,000	1.2X-164000	1.5X-164,000
PAT 65 %	0.65X-106600	0.78X-106600	0.975X-106600
CIAT = PAT + Dep.	0.65X + 57400	0.78X + 57400	0.975X + 57400
PVCF	3.7908	2.3538	1.4615
PV	2.4635X + 217592	1.836X + 135108	1.42X + 83890

Total = 5.7195 X + 436590

P/V of Terminal Cash Inflows: ₹

Nominal value of flats after 15 years	800,000
Less: Tax on Profit [800000x35%]	280,000
	520,000

P/V = 520,000 x 0.239 = ₹124,280

At 10% Rate of Return: P/V of Cash Inflows = P/V of Cash outflows

5.719X + 436,590 + 124,280 = 2590700

X = ₹3,54,896 .

Lease Rent per Flat = 354896/6 = ₹59,150.

30.

a) What are the assumptions of modern portfolio theory? What are the factors providing momentum to outward foreign investments?

b) Info way Ltd. is considering the purchase of an automatic pack machine to replace the 2 machines which are currently used to pack Product X. The new machine would result in reduced labour costs because of the more automated natrue of the process and in addition, would permit production levels to be increased by creating greater capacity

at the packing stage with an anticipated rise in the demand for Product X, it has been estimated that the new machine will lead to increased profits in each of the next 3 yea₹ Due to uncertainty in demand however, the annual cash flows (including savings) resulting from purchase of the new machine cannot be fixed with certainty and have therefore, been estimated probabilically as follows :

Annual cost flows :

Year 1	Probability	Year 2	Probability	Year 3	Probability
10	0.3	10	0.1	10	0.3
15	0.4	20	0.2	20	0.5
20	0.3	30	0.4	30	0.2
		40	0.3		

Because of the overall uncertainty in the sales of Product X, it has been decided that only 3 years fash flows will be considered in deciding whether to purchase the new machine. After allowing for the scrap valu fo the existing machines, the net cost of the new machine will be ₹42,000. The effects of taxation should be ignored.

Required :

a) Ignoring the time value of money, identify which combionations of annual cash flows will lead to an overall negative net cash flow, and determine the total probalility of this occurring.

b) One the basis of the average cost flow for each year, calculate the net present value of the new machine gives that the company's cost of capital is 15%. Relevant discount factors are as follows :

Year	Discount factor
1	0.8696
2	0.7561
3	0.6575

c) Analyse the risk inherent in this situation by simulating the net present value calculation. You should use the random number given at the end of the illustration in 5 sets of cash flows. On he basis of your simulation results what is the expected net prestn value and what is the probability of the new machine yielding a negative net present value ?

	Set 1	Set 2	Set 3	Set 4	Set 5
Year 1	4	7	6	5	0
Year 2	2	4	8	0	1
Year 3	7	9	4	0	3

Answer:

a) The framework of MPT makes many assumptions about investors and markets. Some are explicit in the equations, such as the use of Normal distributions to model returns. Others are implicit, such as the neglect of taxes and transaction fees. None of these assumptions are entirely true, and each of them compromises MPT to some degree.

- **Investors are interested in the optimization problem described above (maximizing the mean for a given variance).** In reality, investors have utility functions that may be sensitive to higher moments of the distribution of the returns. For the investors to use the mean-variance optimization, one must suppose that the combination of utility and returns make the optimization of utility problem similar to the mean-variance optimization problem. A quadratic utility without any assumption about returns is sufficient. Another assumption is to use exponential utility and normal distribution, as discussed below.
- **Asset returns are (jointly) normally distributed random variables.** In fact, it is frequently observed that returns in equity and other markets are not normally distributed. Large swings (3 to 6 standard deviations from the mean) occur in the market far more frequently than the normal distribution assumption would predict. While the model can also be justified by assuming any return distribution that is jointly elliptical, all the joint elliptical distributions are symmetrical whereas asset returns empirically are not.
- **Correlations between assets are fixed and constant forever.** Correlations depend on systemic relationships between the underlying assets, and change when these relationships change. Examples include one country declaring war on another, or a general market crash. During times of financial crisis all assets tend to become positively correlated, because they all move (down) together. In other words, MPT breaks down precisely when investors are most in need of protection from risk.
- **All investors aim to maximize economic utility (in other words, to make as much money as possible, regardless of any other considerations).** This is a key assumption of the efficient market hypothesis, upon which MPT relies.
- **All investors are rational and risk-averse.** This is another assumption of the efficient market hypothesis. In reality, as proven by behavioral economics, market participants are not always rational or consistently rational. The assumption does not account for emotional decisions, stale market information, "herd behavior", or investors who may seek risk for the sake of risk. Casino gamblers clearly pay for risk, and it is possible that some stock traders will pay for risk as well.
- **All investors have access to the same information at the same time.** In fact, real markets contain information asymmetry, insider trading, and those who are simply better informed than others. Moreover, estimating the mean (for instance, there is no consistent estimator of the drift of a brownian when subsampling between 0 and T) and the covariance matrix of the returns (when the number of assets is of the same order of the number of periods) are difficult statistical tasks.
- **Investors have an accurate conception of possible returns, i.e., the probability beliefs of investors match the true distribution of returns.** A different possibility is that investors' expectations are biased, causing market prices to be informationally inefficient.
- **There are no taxes or transaction costs.** Real financial products are subject both to taxes and transaction costs (such as broker fees), and taking these into account will alter the composition of the optimum portfolio. These assumptions can be relaxed with more complicated versions of the model.

- **All investors are price takers, i.e., their actions do not influence prices.** In reality, sufficiently large sales or purchases of individual assets can shift market prices for that asset and others (via cross elasticity of demand.) An investor may not even be able to assemble the theoretically optimal portfolio if the market moves too much while they are buying the required securities.
- **Any investor can lend and borrow an unlimited amount at the risk free rate of interest.** In reality, every investor has a credit limit.
- **All securities can be divided into parcels of any size.** In reality, fractional shares usually cannot be bought or sold, and some assets have minimum orders sizes.
- **Risk/Volatility of an asset is known in advance/is constant**. In fact, markets often misprice risk (e.g. the US mortgage bubble or the European debt crisis) and volatility changes rapidly.

Factors Providing Momentum to Outward Foreign Investments

i) According to UNCTAD's World Investment Report 2011, the stock of outward FDI from developing economies reached US$ 3.1 trillion in 2010 (15.3 per cent of global outward FDI stock), up from US$ 857 billion (10.8 per cent of global outward FDI stock) 10 years ago. On flow basis, outward FDI from developing economies has grown from US$ 122 billion in 2005 to US$ 328 billion in 2010 accounting for around a quarter of total outward FDI witnessed at global level.

ii) FDI is a natural extension of globalisation process that often begins with exports. In the process, countries try to access markets or resources and gradually reduce the cost of production and transaction by expanding overseas manufacturing operations in countries where certain ownership-specific advantages can help them to compete globally. Adoption of such strategies helps them to catch up with competing economies.

iii) A significant uptrend in outward FDI has also been observed in the case of India in recent years. Since globalisation is a two-way process, integration of the Indian economy with the rest of the world is evident not only in terms of higher level of FDI inflows but also in terms of increasing level of FDI outflows.

iv) The overseas investment of domestic corporate sector through FDI has provided them better access to global networks and markets, transfer of technology and skills and also enables them to share research and development efforts and outcomes. It can also be seen as a corporate strategy to promote the brand image and utilisation of raw materials available in the host country. In the Indian context, overseas investments have been primarily driven by either resource seeking or market seeking or technology seeking motives. Of late, there has been a surge in resource seeking overseas investments by Indian companies, especially to acquire energy resources in Australia, Indonesia and Africa.

v) It is against this background that I intend to speak on recent trends and emerging issues in relation to Indian outward FDI. I am thankful to Bombay Chamber of Commerce for choosing this topical subject for today's discussion. In my presentation, I would briefly talk about the evolution of outward FDI policy in India, trends and analysis of outward FDI, funding pattern of outward FDI, measures taken by the Reserve Bank of India and Government of India, emerging issues and end with some thoughts on way forward.

b)

i) If the total cash flow in years 1, 2 and 3 is less than ₹42,000, the net cash flow will be negative. The combinations of cash flow which total less than ₹42,000 are given in table below:

Cash flow (₹ '000)

Year 1	Year 1	Year 1	Total	Probability
10	10	10	30	0.3 × 0.1 × 0.3 = 0.009
10	10	20	40	0.3 × 0.1 × 0.5 = 0.015
10	20	10	40	0.3 × 0.2 × 0.3 = 0.018
15	10	10	35	0.4 × 0.1 × 0.3 = 0.012
20	10	10	40	0.3 × 0.1 × 0.3 = 0.009
				Total = 0.063

The probability of a negative cash flow is 0.063

ii) Expected cash flow = Σ [Cash flow × Probability]

		(₹ '000)
Year 1 EV	= (10×0.3) + (15×0.4) + (20×0.3)	15
Year 2 EV	= (10×0.1) + (20×0.2) + (30×0.4) + (40×0.3)	29
Year 3 EV	= (10×0.3) + (20×0.5) + (30×0.2)	19

P.V. of the cash = (15×0.8696) + (29×0.7561) + (19×0.6575) = 47.4634

The net present value of the new machine = 47,463 – 42,000 = ₹ 5,463

iii) Allocate random number ranges to the cash flows for each year.

	Cashflow (₹ '000)	Probability	Random number
Year 1	10	0.3	0.2
	15	0.4	3.6
	20	0.3	7.9
Year 2	10	0.1	0
	20	0.2	1-2
	30	0.4	3-6
	40	0.3	7-9
Year 3	10	0.3	0.2
	20	0.5	3-7
	30	0.2	8-9

We can now carry out the simulation. (₹ 000)

Year 1			Year 2			Year 3				
No.	**Random**	**Cash**	**DCF**	**Random**	**Cash**	**DCF**	**Random**	**Cash**	**DCF**	**Net PV**
1	4	15	13.044	2	20	15.122	7	20	13.150	-6.684
2	7	20	17.392	4	30	22.683	9	30	19.725	17.800
3	6	15	13.044	8	40	30.244	4	20	13.150	14.438
4	5	15	13.044	0	10	7.561	0	10	6.575	-14.820
5	0	10	8.696	1	20	15.122	3	20	13.150	-5.032
									Total	11.702

The average net present value of the cash flow = 11,702/5 = ₹2,340.40

There out of the five simulations produced negative NPV, therefore, we estimate the probability of a negative NPV as 3/5=0.6. Since the simulation is small, the estimates are unlikely to be reliable.