PAPER-14: ADVANCED FINANCIAL MANAGEMENT

The following table lists the learning objectives and the verbs that appear in the syllabus learning aims and examination questions:

	Learning objectives	Verbs used	Definition
LEVEL C	KNOWLEDGE What you are expected to know	List	Make a list of
		State	Express, fully or clearly, the details/facts
		Define	Give the exact meaning of
	COMPREHENSION What you are expected to understand	Describe	Communicate the key features of
		Distinguish	Highlight the differences between
		Explain	Make clear or intelligible/ state the meaning or purpose of
		Identity	Recognize, establish or select after consideration
		Illustrate	Use an example to describe or explain something
	APPLICATION How you are expected to apply your knowledge	Apply	Put to practical use
		Calculate	Ascertain or reckon mathematically
		Demonstrate	Prove with certainty or exhibit by practical means
		Prepare	Make or get ready for use
		Reconcile	Make or prove consistent/ compatible
		Solve	Find an answer to
		Tabulate	Arrange in a table
	ANALYSIS How you are expected to analyse the detail of what you have learned	Analyse	Examine in detail the structure of
		Categorise	Place into a defined class or division
		Compare and contrast	Show the similarities and/or differences between
		Construct	Build up or compile
		Prioritise	Place in order of priority or sequence for action
		Produce	Create or bring into existence
	SYNTHESIS How you are expected to utilize the information gathered to reach an optimum conclusion by a process of reasoning	Discuss	Examine in detail by argument
		Interpret	Translate into intelligible or familiar terms
		Decide	To solve or conclude
	EVALUATION How you are expected to use your learning to evaluate, make decisions or recommendations	Advise	Counsel, inform or notify
		Evaluate	Appraise or asses the value of
		Recommend	Propose a course of action

PAPER-14: Advanced Financial Management

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

This paper contains 5 questions. All questions are compulsory, subject to instruction provided against each question. All workings must form part of your answer.

Assumptions, if any, must be clearly indicated.

Question No. 1. (Answer **all** questions. Each question carries **2 marks**)

(a) State Index Number. [2]

Answer:

An Index number is a single figure that shows how the whole set of related variables has changed over time or from one place to another. In particular, a price index reflects the overall change in a set of prices paid by a consumer or a producer, and is conventionally known as Cost-of-Living index or Producer's Price Index as the case may be.

(b) The following portfolio details of a fund are available:

Stock	Shares	Price(₹)
A	2,00,000	35
B	3,00,000	40
C	4,00,000	20
D	6,00,000	25

The fund has accrued management fees with the portfolio manager totaling ₹30,000. There are 40 lakhs shares outstanding. Calculate the NAV of the fund. [2]

Answer:

The following portfolio details of a fund are available:

Stock	Shares	Price(₹)	Value
A	2,00,000	35	70,00,000
B	3,00,000	40	120,00,000
C	4,00,000	20	80,00,000
D	6,00,000	25	150,00,000
TOTAL			420,00,000

NAV of the fund = (420,00,000 – 30,000)/40,00,000=₹10.4925

(c) Define Merchant Banker as per SEBI. [2]

Answer:

As per SEBI, Merchant Banker may be defined as any person who is engaged in the business of issue management either by making arrangements regarding selling, buying or subscribing to the securities as manager, consultant, advisor or rendering corporate advisory service in relation to such issue management.

(d) State French Auction. [2]

Answer:

All bids equal to or above the cut-off price are accepted. However, the successful bidders are required to pay for the allotted quantity of securities at the respective price/yield at which they have bid. This method is followed in the case of 364 days treasury bills and is valid only for competitive bidders. An investor may bid in an auction under either of the following categories:

- Competitive Bidding
- Non-Competitive Bidding

(e) An American company's Japanese subsidiary, Tahoma Japan, has exposed assets of ¥8 billion and exposed liabilities of ¥6 billion. During the year, the yen appreciates from ¥125/$ to ¥95/$. Calculate Tahoma Japan's net translation exposure at the beginning of the year in yen and in dollars. [2]

Answer:

Tahoma Japan has net translation exposure of ¥2 (¥8 - ¥6). Converted into dollars, this figure yields translation exposure of $16 million (2 billion/125).

(f) Stock A is expected to give an average return of 40% and stock B which is expected to give a return of 30%. If the proportion of investments in A and B is 70:30, find expected return of portfolio? [2]

Answer:

The proportion of investments in A and B is 70:30, then the expected return of the portfolio = 0.7 x 40% + 0.3 x 30% = 37%.

(g) X owns a stock portfolio equally invested in a risk free asset and two stocks. If one of the stocks has a beta of 0.8 and the portfolio is as risky as the market, determine the beta of the other stocks in the portfolio. [2]

Answer:

Beta of market = $\beta_m = \beta_p = 1$
$\beta_p = 1/3(0.8) + 1/3(x) + 1/3(0) = 1$
Solving, we get beta of other stock = 2.2.

(h) One of the advantages of Cross Border leasing is Double Dip Lease. – Justify. [2]

Answer:

Cross Border leasing has been widely used to arbitrage the difference in the tax laws of different countries thus making them tax avoidance and tax shelters. This is possible since each country applies differing rules for determining whether the party acting as lessor under a cross-border lease is the owner of the leased asset for tax purposes enabling him to claim tax allowances.

(i) Optimistic Ltd has an EPS of ₹90 per share. Its Dividend Payout Ratio is 40%. Its earnings and dividends are expected to grow at 5% per annum. Find out the cost of Equity Capital if its Market Price is ₹360 per share. [2]

Answer:

$$K_e = \frac{\text{Dividend per share}}{\text{Market price per share}} + g(\text{growth rate})$$

$$= \frac{₹90 \text{ x } 40\%}{₹360} + 5\%$$

= 10% +5% =15%.

(j) A German machine is selling for 80,000 Euros. Calculate the dollar price in the U.S. for the German machine if the exchange rate is 1.20 Euros per dollar. [2]

Answer:

We are given the current exchange rate as 1$ = 1.20 Euros
Therefore 1 Euro =$0.833
In the US the machine would have cost
80,000 Euros x 0.833 = $66,640.

Question No. 2. (Answer **any three** questions. Each question carries **8 marks**)

2. (a) (i) Mr. S Ghosh had purchased 1000 units of a scheme of Birla MF at the rate of ₹60 per unit. He held the units for 2 years and got a dividend of 15% and 20% in the first year, and second year respectively on the face value of ₹10 per unit. At the end of the second year, the units are sold at the rate of ₹75 per unit. Determine the effective rate of return per year which Mr. Ghosh has earned on this MF scheme. [5]

2. (a) (ii) NBFCs lend and make investments and hence their activities are akin to that of banks. – State the differences. [3]

Answer:

2. (a) (i):

Total investment made by Mr. Ghosh = 1000 x ₹60 = ₹60,000.

Dividends received- First Year = ₹1.5 x 1000 = ₹1500

Dividends received- Second Year = ₹2 x 1000 = ₹2000

Proceed from sale of units = 1000 x ₹75 = ₹75,000

Total absolute return = $\frac{(75,000-60,000)+1500+2000}{60000}$ = 30.833%

Effective rate of return is the Compounded Annual Rate, which is 'r' in the following equation:

78,500 = 60,000 $(1+r)^2$

r = Effective rate = $\sqrt{\frac{78500}{60000}}-1$ = 14.38% per annum.

2. (a) (ii):

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.

2. (b) (i) Mr. A purchased Treasury Bill for ₹9950 maturing in 91 days for ₹10,000.Find what would be the annualized investment rate for Mr. A. Government, on the other hand pays ₹5000 at maturity for 91 days Treasury Bill. If Mr. A is desirous to earn an annualized discount rate of 3.5%, then calculate the maximum amount he can pay for Treasury Bill. [3]

2. (b) (ii) List the aspects that should be borne in mind by a depositor while making deposits with an NBFC. [5]

Answer:

2. (b)(i):

Investment rate for Mr. A = $\frac{₹(10,000-9950)}{9950} \text{ x } \frac{365}{91} = 0.02015 = 2.02\%$.

Suppose X be the maximum amount Mr. A can pay for Treasury Bill.

Then, $\frac{₹5000-X}{₹5000} \text{ X } \frac{365}{91}$ = 0.035

₹5000 – X = ₹43.63

X = ₹4956.37.

Note: 365 days in a year is considered for calculation.

2. (b)(ii):

While making deposits with an NBFC, the following aspects should be borne in mind:

(i) Public deposits are unsecured.
(ii) A proper deposit receipt is issued, giving details such as the name of the depositor/s, the date of deposit, the amount in words and figures, rate of interest payable and the date of repayment of matured deposit along with the maturity amount. Depositor/s should insist on the above and also ensure that the receipt is duly signed and stamped by an officer authorised by the company on its behalf.
(iii) In the case of brokers/agents etc collecting public deposits on behalf of NBFCs, the depositors should satisfy themselves that the brokers/agents are duly authorized by the NBFC.
(iv) The Reserve Bank of India does not accept any responsibility or guarantee about the present position as to the financial soundness of the company or for the correctness of any of the statements or representations made or opinions expressed by the company and for repayment of deposits/discharge of the liabilities by the company.
(v) Deposit Insurance facility is not available to the depositors of NBFCs.

2. (c) (i) The common share of a company is selling at ₹90. A 21 week call is selling at ₹8. The call's exercise price is ₹100. The risk free rate is 10% p.a. Calculate the price of a 21 week put of ₹100. [3]

2. (c) (ii) Nifty Index is currently quoting at 1329.78.Each lot is 250. Z purchases a March contract at 1364. He has been asked to pay 10% initial margin. Calculate the amount of initial margin. If Nifty futures rise to 1370, then find the percentage gain. [2]

2. (c) (iii) Name the participants in commodity futures. [3]

Answer:

2. (c) (i):

Value of Call =₹8, Strike Price = ₹100, Current price =₹90, rate of interest = 10%

Time period = 21 weeks = 0.404 year.

From Put Call Parity Theorem, we know that,

$$P + S = C + \frac{X}{1+rt}$$

$$P = 8 - 90 + \frac{100}{1+0.10 \times 0.404} = 8 - 90 + 96.12 = 14.12$$

Value of put option = ₹14.12

2. (c) (ii):

The initial margin = Value of contract x 10% = 1364 x 250 x 0.10 = ₹34100.

Z has to deposit ₹34100 upfront for his purchase of futures.

Since the price has risen to 1370, he would make a gain of ₹(1370 -1364) x 250 = ₹1500 i.e. 1500/34100 = 4.4% approx.

2. (c) (iii):

Participants in Commodity Future

- Farmers/Producers
- Merchandisers / Traders
- Importers
- Exporters
- Consumers/ Industry
- Commodity Financers
- Agriculture credit providing agencies
- Corporate having price risk exposure in commodities.

2. (d) (i) How risk mitigation helps the infrastructure sector of India ? [5]

2. (d) (ii)Calculate the current price of a money market instrument with face value of ₹100 and discount yield of 8% in 90 days. Take 1 year = 360 days. [3]

Answer:

2. (d) (i):

The advantages of risk mitigation for India are many:

- India would be able to mobilize international and domestic private capital for development of infrastructure and as a supplement to limited public resources.
- When risk mitigation instruments cover the excessive risk or practically unmanageable risks as perceived by the investors, then private investors would be interested in investing in the sector.
- It becomes easier for the Government to share the risks of infrastructure development using its limited financial resources when it is tendered help by the private sector; thereby leading to greater increase in infrastructural development.
- Government can upgrade its own credit as borrower or as a guarantor for public and private projects by using risk mitigation instruments of more creditworthy institutions which can significantly lower the cost of capital for the infrastructure project.
- Risk mitigation instruments facilitate the creation of commercial and sustainable financing mechanisms for infrastructure development and efficiency in the flow of international and local private capital.

2. (d) (ii):

For a money market instrument, we can find the price using the yield price formula

$$Y = \frac{F - P}{P} X \frac{360}{n} X 100$$

Where the yield is given as 8%, F is the face value = ₹100, n= 90 days.
Substituting the above formula we get:

$$8 = \frac{100 - P}{P} X \frac{360}{90} X 100 = ₹98.04$$

Question No. 3. (Answer **any two** questions. Each question carries **10 marks**)

3. (a) (i) List the features of Interest Rate Caps. [4]

3. (a)(ii) The annual interest rate is 5% in the United States and 8% in the UK. The spot exchange rate is £/$ -1.50 and forward exchange rate, with one year maturity, is £/$ =1.48. In view of the fact that the arbitrager can borrow $ 100000 at current spot rate, calculate the arbitrageur profit/loss. [6]

Answer:

3. (a) (i)

Features of Interest Rate Caps are:

- The buyer of an Interest Rate Cap pays premium to the seller for the right to receive the difference in interest cost (on notional principal) when a specified index of market interest rates rises above a stipulated "cap rate".
- The buyer has no obligation or liability if interest rates fall below the specified cap rate.
- Thus, a cap resembles an option which represents a right rather than an obligation to the buyer.
- Interest rate caps cover periods ranging from 1-10 years with interest rate reset and payment dates most commonly set either 3 or 6 months apart.

3. (a) (ii)

We first verify the interest rate parity to decide, whether any arbitrage exists.
We have spot, 1£ = $1.50
LHS = $(1 + r_{\text{home country}})$ = 1+ 0.05 = 1.05
RHS = Forward/Spot $(1+ r_{\text{foreign country}})$=1.48/1.50 x (1+0.08)=1.0656
Since LHS≠RHS, parity does not exist, and there exists an opportunity to arbitrage.
Since LHS is lower, the borrowing would be done in dollars. The borrowed money would be converted to £ and invested. The profit can be calculated as follows:
Assume borrowing $100000. The repayment would be at the rate of 5% in 12 months i.e. $100000 x 1.05 = $105000.

$100000 converted to £ at spot would yield £66667. This on deposit for 12 months would yield £72000. This converted back to $ would give us $106560.
Thus net arbitrage profit would be = $106560- $105000 = $1560.

3. (b) (i) ADS 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%. [8]

3. (b) (ii) How credit rating provides guidance to investors/creditors in determining a credit risk associated with a debt instrument? [2]

Answer:

3. (b)(i)

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)

3.14 = 1.12 (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%.

Computation of Net Present Value **(USD in Lakhs)**

Particulars	Year	PV Factor @9.93%	Cash Flow	Disc.Cash Flow
Annual Cash Inflow	1	$1/1.0993 = 0.910$	20.00	18.20
	2	$1/1.0993^2 = 0.827$	25.00	20.68
	3	$1/1.0993^3 = 0.753$	30.00	22.59
	4	$1/1.0993^4 = 0.685$	40.00	27.40

	5	$1/1.0993^5 = 0.623$	50.00	31.15
Present Value of cash Inflows				120.02
Less: Initial Investment				(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

3. (b) (ii)

To provide guidance to investors/ creditors in determining a credit risk associated with a debt instrument/ credit obligation.

- Current Opinion on Credit Risk: Credit Rating is based on the relative capability and willingness of the issuer of the instrument to service the debt obligations (both principal and interest) as per the terms of the contract. Thus, it acts as an indicator of the current opinion of the credit risk and can be changed from time to time.
- Relative Ranking: Credit Rating ranks the fixed income investment based on the probability of it (Investment / instrument) defaulting, in comparison with other rated instruments.

3. (c) Company PQR and DEF have been offered the following rate per annum on a $ 200 million five year loan:

Company	**Fixed Rate**	**Floating Rate**
PQR	**12.0**	**LIBOR+0.1%**
DEF	**13.4**	**LIBOR + 0.6%**

Company PQR requires a floating - rate loan; Company DEF requires a fixed rate loan. Design a swap that will net a bank acting as intermediary at 0.5 percent per annum and be equally attractive to both the companies. [10]

Answer:

3. (c)

Particulars	**₹**
(a) Difference in Floating Rates [(LIBOR + 0.1%) - (LIBOR + 0.6%)]	0.5%
(b) Difference in Fixed Rates [13.4%- 12%]	1.4%
(c) Net Difference {[(a) - (b)] in Absolute Terms}	0.9%
(d) Amount paid for arrangement of Swap Option	(0.5%)
(e) Net Gain [(c) - (d)]	0.4%
(f) Company PQR's share of Gain [0.4/% X 50%]	0.2%
(g) Company DEF's share of Gain [0.4% X 50%]	0.2%

PQR is the stronger Company (due to comparative interest advantage). PQR has an advantage of 1.40% in Fixed Rate and 0.50% in Floating Rate. Therefore, PQR enjoys a higher advantage in Fixed Rate loans. Therefore, PQR will opt for Fixed Rate Loans with its Bankers. Correspondingly DEF Ltd will opt for Floating Rate Loans with its bankers.

Company PQR	Company DEF
1. Company PQR will borrow at Fixed Rate.	1. Company DEF will borrow at Floating Rate.
2. Pay interest to Bankers at Fixed Rate (i.e. 12.0%)	2. Pay interest to its Bankers at Floating Rate (i.e. LIBOR + 0.6%)
3. Will collect from Company DEF interest amount differential i.e. Interest computed at Fixed Rate (12.0%) Less Interest Computed at Floating Rate of (LIBOR + 0.1 %) = 11.9% -LIBOR	3. Will pay to Company PQR interest amount differential i.e. Interest computed at Fixed Rate (12.0%) Less Interest Computed at Floating Rate of (LIBOR + 0.1%) = 11.9% - LIBOR
4. Receive share of Gain from Company DEF (0.2%)	4. Pay to Company PQR its share of Gain = 0.2%
5. Effective Interest Rate: 2-3=12.0%-(11.90% - LIBOR) -0.2% = LIBOR - 0.1%	5. Pay Commission Charges to the Financial Institution for arranging Interest Rate Swaps i.e. 0.5%
	6. Effective Interest Rate: 2 + 3 + 4+5 = Floating Rate to Company DEF (LIBOR + 0.6%) + Interest Differential paid to Company PQR (11.9% -LIBOR) + Commission charges paid for arranging Swaps + Share of gain paid to Company PQR = LIBOR + 0.60 % + 11.9% - LIBOR + 0.5% +0.2%= 13.2%

Question No. 4. (Answer **any two** questions. Each question carries **8 marks**)

4. (a) (i) A trader is having in its portfolio shares worth ₹85 lakhs at current price and cash ₹15 lakhs.The beta of share portfolio is 1.6. After 3 months the price of shares dropped by 3.4%.

Calculate:

- **Current Portfolio Beta.**
- **Portfolio beta after 3 months if the trader on current date goes for long position on ₹100 lakhs Nifty futures.** **[1+5]**

4. (a) (ii) State Breadth Index. **[2]**

Answer:

4. (a) (i)

A trader is having ₹85 lakhs worth equity portfolio out of total of ₹100 lakhs i.e. 85% or 0.85, and the balance in the form of cash i.e. 15% or 0.15.Beta of equity portion is 1.6 and we know that beta of cash portion is zero.

Portfolio beta = 0.85 x 1.6 +0.15 x 0 =1.36

If the trader goes long on Nifty Futures worth ₹100 lakhs, we can form the equation representing the total position as follows:

Value of current Portfolio x Current Beta + Value of Futures Held x Beta of Futures = Value of overall value of both assets x Beta of overall portfolio

Value of Current Portfolio x 1.6 + 100 x 1.0 = Value of overall value of both assets x Beta of overall portfolio

Now it is given that the value of equity share is likely to fall by 3.4%. In that case ₹85 lakhs worth of equity would get reduced to=₹85 lakhs x (1-.034)

=₹82.11 lakhs.

Total value (Equity + Cash)= ₹97.11 lakhs.

In that case the overall portfolio beta would change to:

$$\frac{82.11}{82.11+15}\times 1.6+\frac{15}{82.11+15}\times 0=1.353$$

Substituting 1.353, in the above formula we get:

97.11 x 1.353 + 100 x 1.0 = 197.11 x Beta of overall portfolio.

Beta of the overall portfolio = 1.174

4. (a)(ii)

Breadth Index covers all securities traded and also the volume of transactions to give a view of the direction of the stock market movements. It is an addition to the Dow Theory and the movement of the Dow Jones Averages. If it supports the movement of the Dow Jones Averages, this is considered sign of technical strength and if it does not support the averages, it is a sign of technical weakness i.e. a sign that the market will move in a direction opposite to the Dow Jones Averages.

4. (b) Mr. Ram is holding the following securities:

Particulars of Securities	Cost(₹)	Dividends(₹)	Market Price(₹)	Beta
Equity Shares				
AB Ltd.	**11,000**	**1,800**	**12,000**	**0.6**
DB Ltd.	**16,000**	**1,000**	**17,200**	**0.8**
SD Ltd.	**12,000**	**800**	**18,000**	**0.6**
GOI Bonds	**40,000**	**4,000**	**37,500**	**1.0**

Calculate:

- **Expected rate of return in each case, using the Capital Asset Pricing Model (CAPM).**
- **Average rate of return, if risk free rate of return is 14%. [8]**

Answer:

4. (b) Average return on Market Portfolio = R_m = Returns / Investment

$$= \frac{\text{Dividends} + \text{Capital Appreciation}}{\text{Initial Invt}} \times 100$$

$$= \frac{[(1800+1000+800+4000)+(1000+1200+6000-2500)]}{79000} \times 100 = 16.84\%$$

Expected rate of return on individual portfolio, by applying CAPM

$E(r_i) = R_f + \beta(R_m - R_f)$

Investment in equity shares of	R_f %	R_m %	Beta Risk Factor	$E(r_i)$ % Using CAPM
AB Ltd.	14	16.84	0.6	15.70
DB Ltd.	14	16.84	0.8	16.27
SD Ltd.	14	16.84	0.6	15.70
GOI Bonds	14	16.84	1.0	16.84

Average Rate of Return:

Using CAPM and substitute for average beta.

Average Beta = $\frac{0.6+0.8+0.6+1.0}{4} = 0.75$

Average Return = $R_f + \beta(R_m - R_f) = 14 + 0.75(16.84 - 14) = 16.13\%$

4. (c) (i) 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? [5]

4. (c) (ii) An investor is seeking the price to pay for a security, whose standard deviation is 5%. The correlation coefficient for the security with the market is 0.80and the market standard deviation is 4.40%. The return from Government securities is 5.20% and from the market portfolio is 9.80%.The investor knows that, by calculating the required

return, he can then determine the price to pay for the security. Calculate the required return on security. [3]

Answer:

4. (c) (i)

Expected Return E(r) under CAPM = $R_f + \beta(R_m - R_f)$
Risk free return (R_f) = 6%
Risk Premium ($R_m - R_f$) = 7%
Beta of Stock P (β_P) = 1.50
Beta of Stock Q (β_Q) = 0.80
Stock P [E (R_p)]= $R_f + \beta_p(R_m - R_f)$ = 6% +1.50 x7% = 16.50%
Stock Q [E (Rq)]= $R_f + \beta_p(R_m - R_f)$ = 6% +0.8 x 7% = 11.60%

Evaluation of Market Price

Particulars	**Stock P**	**Stock Q**
Expected return (Market)[A]	15.00%	12.5%
Expected Return under CAPM[B]	16.50%	11.60%
Market Expectations[A] Vs CAPM[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 Q is undervalued
Recommendation	SELL	BUY

4. (c)(ii)

$$\text{Beta, } \beta = \rho_{SM} \times \frac{\sigma_S}{\sigma_M}$$

β= 0.80 x (5.00/4.40) = 0.909

Computation of required rate of return (based on CAPM)
Expected Return = R_f + β of security ($R_m - R_f$)
Expected Return = 5.20% + 0.909(9.80% - 5.20%) = 9.38%.

Question No. 5. (Answer **any two** questions. Each question carries **10 marks**)

5. (a) ABC Ltd. is planning to procure a machine at an investment of ₹40 lakhs. The expected cash flow after tax for next three years is as follows:

Year -1		**Year-2**		**Year-3**	
CFAT	**Probability**	**CFAT**	**Probability**	**CFAT**	**Probability**
12	**0.1**	**12**	**0.1**	**18**	**0.2**
15	**0.2**	**18**	**0.3**	**20**	**0.5**
18	**0.4**	**30**	**0.4**	**32**	**0.2**
32	**0.3**	**40**	**0.2**	**45**	**0.1**

The company wishes to consider all possible risks factors relating to the machine.
The company wants to know:

- **The expected NPV of this proposal assuming independent probability distribution with 7% risk free rate of interest.**
- **The possible deviations on expected values. [10]**

Answer:

5. (a)

Expected NPV **(₹ in lakhs)**

Year -1			Year-2			Year-3		
CFAT	**Probability**	**CFXT**	**CFAT**	**Probability**	**CFXT**	**CFAT**	**Probability**	**CFXT**
12	0.1	1.2	12	0.1	1.2	18	0.2	3.6
15	0.2	3	18	0.3	5.4	20	0.5	10
18	0.4	7.2	30	0.4	12	32	0.2	6.4
32	0.3	9.6	40	0.2	8	45	0.1	4.5
$\bar{X}$	**1.0**	**21**		**1.0**	**26.6**		**1.0**	**24.5**

NPV	**PV factor @ 7%**	**Total PV**
21	0.935	19.63
26.6	0.873	23.22
24.5	0.816	20.00
PV of cash inflow		62.85
Less: Cash outflow		40
NPV		**22.85**

Possible deviation in the expected value
Year-1

X- $\bar{X}$	**X-** $\bar{X}$	**(X-** $\bar{X}$ **)²**	**p**	**(X-** $\bar{X}$ **)² x p**
12-21	-9	81	0.1	8.1
15-21	-6	36	0.2	7.2
18-21	-3	9	0.4	3.6
32-21	11	121	0.3	36.3
				55.2

$\sigma = \sqrt{55.2} = 7.43$

Year-2

$X-\bar{X}$	$X-\bar{X}$	$(X-\bar{X})^2$	p	$(X-\bar{X})^2 \times p$
12-26.6	-14.6	213.16	0.1	21.316
18-26.6	-8.6	73.96	0.3	22.188
30-26.6	3.4	11.56	0.4	4.624
40-26.6	13.4	179.56	0.2	35.912
				84.04

$\sigma = \sqrt{84.04} = 9.17$

Year-3

$X-\bar{X}$	$X-\bar{X}$	$(X-\bar{X})^2$	p	$(X-\bar{X})^2 \times p$
18-24.5	-6.5	42.25	0.2	8.45
20-24.5	-4.5	20.25	0.5	10.125
32-24.5	7.5	56.25	0.2	11.25
45-24.5	20.5	420.25	0.1	42.025
				71.85

$\sigma = \sqrt{71.85} = 8.48$

Standard Deviation of expected Value:

$$\sqrt{\frac{55.2}{(1.07)^2} + \frac{84.04}{(1.07)^4} + \frac{71.85}{(1.07)^6}} = 12.66$$

5. (b)(i) A firm has projected the following cash flows from a project under evaluation:

Year	₹ lakhs
0	**(70)**
1	**40**
2	**40**
3	**20**

The given cash flows have been made at expected prices after recognizing inflation. The firms cost of capital is 10%. The expected annual rate of inflation is 5%.Show how the viability of the project is to be evaluated using both nominal rate of discount and real rate of discount. [8]

5. (b)(ii) 'Promoters capacity and competence is examined, with reference to their Management background by Financial Institutions under project appraisal'. Name them. [2]

Answer:

5. (b)(i)

The projects where inflation is involved we either discount the nominal flows with the nominal rate or real cash flows with the real rate. Both should give identical answers. In the given problem we are provided with nominal cash flows and nominal rate.

NPV using nominal rate of discount **₹lakhs**

Year	CFAT	PV factor at 10%	Total PV
1	40	0.909	36.36
2	40	0.826	33.04
3	20	0.751	15.02
Total Present value			84.42
Less: Cash Outflow			70.00
Net Present Value			**14.42**

The above NPV can also be found at by discounting real cash flows with real discount rate.

Determination of real discount rate

R = (1+n)/(1+i)-1 = (1.10/1.05)-1 = 0.0476 or 4.76%

NPV using real rate of discount **₹lakhs**

Year	CFAT	Deflated factor at 0.05	Real CF	PV factor at 4.76%	Total PV
1	40	0.952	38.08	0.955	36.36
2	40	0.907	36.28	0.911	33.05
3	20	0.864	17.28	0.869	15.01
Total Present value					84.42
Less: Cash Outflow					70
Net Present Value					**14.42**

5. (b)(ii)

Promoters capacity and competence is examined, with reference to their Management Background-

- Traits as entrepreneurs
- Business or industrial experience
- Past performance, etc.

Different considerations are applied in the case of new entrepreneurs.

5. (c) (i) **Company Z is forced to choose between two machines A and B. The two machines are designed differently, but have identical capacity and do exactly the same job. Machine A costs ₹1,50,000 and will last for 3 years. It cost ₹40,000 per year to run. Machine B is an economy model costing only ₹1,00,000 but will last only for 2 years and costs ₹60,000 per year to run. These are real cash flows. The costs are forecasted in rupees of constant purchasing power. Ignore tax. Opportunity cost of capital is 12%. Recommend the machine to be bought. [6]**

5. (c) (ii) **Explain financial forecasting. [4]**

Answer:

5. (c)(i)

Compound present value of 3 years @ 12% = 2.40
P.V. of running cost of Machine A for 3 years = ₹40000 x 2.40 = ₹96,000.
Compound present value of 2 years @ 12% = 1.69
P.V. of running cost of Machine B for 2 years = ₹60000 x 1.69 = ₹1,01,400.

Statement showing evaluation of Machine A and B **(Amount in ₹)**

Particulars	Machine A	Machine B
Cost of purchase	1,50,000	1,00,000
Add: P.V. of running cost	96,000	1,01,400
P.V. of cash outflow	2,46,000	2,01,400
Equivalent present value of annual cash outflow	2,46,000	2,01,400
	2.40	1.69
	1,02,500	1,19,172

Since the annual cash outflow of Machine A is lower, Company Z should buy Machine A.

5. (c)(ii)

Financial forecasting describes the process by which firms think about and prepare for the future. The forecasting process provides the means for a firm to express its goals and priorities and to ensure that they are internally consistent. It also assists the firm in identifying the asset requirements and needs for external financing.

For example, the principal driver of the forecasting process is generally the sales forecast. Since most Balance Sheet and Income Statement accounts are related to sales, the forecasting process can help the firm assess the increase in current and fixed assets which will be needed to support the forecasted sales level. Similarly, the external financing which will be needed to pay for the forecasted increase in assets can be determined.

Firms also have goals related to capital structure (the mix of debt and equity used to finance the firm's assets), dividend policy, and working capital, management. Therefore, the forecasting process allows the firm to determine if its forecasted sales growth rate is consistent with its desired capital structure and dividend policy.