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) Ashrin Ltd. has an EPS of ₹ 3 last year and it paid out 60% of its earnings as dividends that year. This growth rate in earnings and dividends in the long term is expected to be 6%. If the required rate of return on equity for Ashrin Ltd. is 14%. What would be its P/E ratio? [2]

Answer to (a):

$$P/E\ Ratio = \frac{Pay\text{-}out\ ratio}{r - gn}$$

$$= \frac{0.6(1.06)}{0.14 - 0.06}$$

$$= \frac{0.636}{0.08} = 7.95$$

(b) Define Non-financial Intermediaries? [2]

Answer to (b):

Non-financial intermediaries are those institutions which do the loan business but their resources are not directly obtained from the savers. Many non-banking institutions also act as intermediaries and when they do so they are known as non-banking financial intermediaries, e.g. LIC, GIC, IDBI, IFC, and NABARD.

(c) The Beta co-efficient of equity stock of TECHBOARD LTD. is 1.6. The risk-free of return is 12% and the required rate of return is 18% on the market portfolio. If the dividend expected during the coming year is ₹2.50 and the growth rate of dividend and earnings is 8%, at what price the stock of Techboard Ltd. can be sold (based on the CAPM) ? [2]

Answer to (c):

Expected rate of return: (By applying CAPM)

$R_e = R_f + \beta_t (R_m - R_f)$

$= 12\% + 1.6 (18\% - 12\%)$

$= 12\% + 9.6\% = 21.6\%$

Price of stock: (with the use of dividend growth model formula)

$R_e = D_t/P_0 + g$

$0.216 = 2.50/(P_0 – 0.08)$

Or, $P_0 = 2.50/(0.216 – 0.08)$

= 2.50/0.136 = ₹18.38

(d) The current spot rate for the US$ is ₹ 50. The expected inflation rate is 6 per cent in India and 2.5 per cent in the US. What will be the expected spot rate of the US$ a year hence? [2]

Answer to (d):

$$\frac{(\text{Expected sopt rate a year from now})}{\text{Current Spot rate})} = \frac{(1+\text{Expected inflation on home country})}{1+\text{Expected Inflation in foreign country})}$$

Or, Expected spot rate of US$ a year hence = (₹ x 1.06)/1.025 = ₹ 51.71

(e) PNB Ltd. placed ₹52 Crores in overnight call with a foreign bank for a day in overnight call. The call ruled at 5.65% p.a. What is the amount it would receive from the foreign bank the next day? [2]

Answer to (e):

Amount placed in call = ₹52 crores

Interest = 5.65% p.a.

Amount receivable next day = Principal + Interest for a day

$$= ₹52 \text{ Crores} + 52 \text{ crores} \times \frac{1}{365} \times \frac{5.65}{100}$$

= ₹52,00,80,493

(f) The rates available in the Kolkata market are:

₹/$ Spot	**46.75/78**
£/$	**0.5285/86**

If an Indian Importer requires pounds, calculate the rate quoted to him. [2]

Answer to (f):

The rate to be quoted to the importer is the Ask rate

$= (₹/\$)_{Ask} \times (\$/N)_{Ask}$

$= (₹/\$)_{Ask} \times (1/(£/\$)_{Bid}$

= 46.78 x 1/0.5285 = ₹ 88.51/£

(g) What do you mean by viability gap funding? [2]

Answer to (g):

Viability gap funding was introduced in 2006, which provides Central Government grants up to 20 per cent of the total capital cost to PPP projects undertaken by any central ministry, state government, statutory entity, or local body. The scheme aimed at providing upfront capital grant to PPP projects to enable financing of commercially unviable projects. The level of grant is the net present value of the gap between the project cost and estimated revenue generation over the concession period based on a user fee that was to be levied in a pre-determined manner.

(h) Angel Ltd., an export customer who relied on the interbank rate of ₹/$ 46.50/10 requested his banker to purchase a bill for USD 80,000. What is the rate to be quoted to Angel Ltd. if the banker wants a margin of 0.08%? [2]

Answer to (h):

Profit margin of 0.08% is to be deducted from the bid rate.
That is 46.50 x 0.0008 = ₹ 0.04
Spot bid rate = 46.50 – 0.04 = ₹ 46.46

(i) TWO FIRMS Preeti Ltd and Mahati Ltd. are similar in all respects expect that Mahati Ltd. uses ₹ 10,00,000 debt in its capital structure. If the corporate tax rate for these firms is 40%. Calculate the value of Mahati Ltd. exceeds that of Preeti Ltd. [2]

Answer to (i):

When Corporate taxes are considered, the value of the firm that is levered would be equal to the value of the unlevered firm increased by the tax shield associated with debt i.e.,

$$V = \frac{0(1+ti)}{K} + t_1B$$

Therefore, Value of Mahati Ltd. would exceed the value of Preeti Ltd. by only t_1B i.e., 0.4 x 10,00,000 = ₹ 4,00,000.

(j) The stock of Anusa Ltd. has a beta of 0.95 and an expected return of 13.60 per cent. The market portfolio has an expected return of 14.00 per cent. Based on CAPM what would be the risk premium for Anusa Ltd.'s stock? [2]

Answer to (j):

Expected return on Equity fund = 7.00 + 10.00= 17%
Applying the SML equation to Anusa Ltd's stock:
$0.136 = Rf. + 0.95\ (14.0 - R_1) \rightarrow R_1\ (1 - 0.95) = (0.136 - 0.95 \times 0.140)$

Therefore $R_1 = \frac{0.136 - 0.133}{0.05}$ = 0.06 i.e., 6%

Hence, Risk Premium for Anusa Ltd.'s stock:
$E(R_1) - R_1 = 0.136 - 0.06 = 0, 0.076$ i.e., 7.60%

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

2.(a) (i) Are Secured debentures treated as Public Deposit? If not who regulates them? [2]

2.(a) (ii) What are the benefits of future trading? [3]

2.(a) (iii) Suppose a company issues a Commercial Paper as per the following details:

Date of Issue	**17th January 2014**
Date of Maturity	**17th April 2014**
No. of Days	**90 days**
Face Value	**₹ 1000**
Issue Price	**₹ 985**
Credit rating exp.	**0.5% of the size of issue**
IPA charges	**0.35%**
Stamp Duty	**0.5%**

What is the cost of the commercial paper? What is the yield to investor? [2+1]

Answer to 2(a)(i):

Debentures secured by the mortgage of any immovable property of the company or by any other asset or with an option to convert them into shares in the company, if the amount raised does not exceed the market value of the said immovable property or other assets, are excluded from the definition of 'Public Deposit' in terms of Non-Banking Financial Companies Acceptance of Public Deposits (Reserve Bank) Directions, 1998. Secured debentures are debt instruments and are regulated by Securities & Exchange Board of India.

Answer to 2(a)(ii):

Benefits of Futures Trading

- **Price discovery for commodity players**
  - A farmer can plan his crop by looking at prices prevailing in the futures market
- **Hedging against price risk**
  - A farmers can sell in futures to ensure remunerative prices
  - A processor/ manufacturing firm can buy in futures to hedge against volatile raw material costs
  - An exporter can commit to a price to his foreign clients
  - A stockiest can hedge his carrying risk to ensure smooth prices of the seasonal commodities round the year
- **Easy availability of finance**
  - Based on hedged positions commodity market players (farmers, processors, manufacturers, exporters) may get easy financing from the banks.

Answer to 2(a)(iii):

We know that $\left[\frac{\text{Face Value - Sale Price}}{\text{Sale Price}}\right] x \left[\frac{360}{\text{Maturity Period}}\right]$ = cost of CP

Numerator = Total Discount = Discount + Rating Charges + IPA charges + Stamp Duty

Therefore Discount [on FV ₹ 1000] = ₹15 + 5 + 5 + 3.5 = ₹ 28.5

Cost of CP = $\frac{28.5}{985} x \frac{360}{90}$ = 0.1157 or 11.6%

Yield to investor = $\frac{15}{985} x \frac{360}{90}$ x 100 = 6.09%

2.(b) (i) State five important regulations prescribed by SEBI for the investments that can be made by a Mutual Fund. [5]

2.(b) (ii) The unit price of TSS Scheme of a mutual fund is ₹ 10. The public offer price (POP) of the unit is ₹ 10.204 and the redemption price is ₹ 9.80. Calculate: (1) Front-end Load, and (2) Back-end Load. [$1^1/_2$+$1^1/_2$]

Answer to 2(b)(i):

SEBI REGULATIONS FOR INVESTMENTS OF A MUTUAL FUND: The investments of a mutual fund are governed by a set of regulations of the SEBI and the five import; ones are as under:

(i) In all the schemes taken together, a mutual fund shall not own more than 10% of the company's paid up capital;

(ii) A scheme shall not invest more than 15% of the NAV in debt instruments issued by a single issuer which are rated not below investment grade by an authorized credit rating agency;

(iii) Barring certain exceptions, a scheme shall not invest more than 10% of its NAV in the equity shares or equity related instruments of one company;

(iv) A scheme shall not invest more than 5% of its NAV in unlisted equity shares or equity related instruments in case of an open ended scheme and 10% of its NAV in case of close ended scheme;

(v) Mutual funds shall mark all investments to market.

Answer to 2(b)(ii):

(1) Calculation of Front-end Load (%)
We know that Sale Price = NAV (1 + Front-end Load %)
Since, Unit Price = ₹ 10.00, we have NAV = ₹10. We are given,
Sale Price = ₹ 10.204
Therefore we have Front-end Load% = 10.204/10 - 1 = 2.04%

(2) Repurchase Price = NAV (1- Back-end Load %)
Since, Unit Price = ₹ 10.00, we have NAV = ₹ 10. We are given, Repurchase Price = ₹9.80
Therefore we have Back-end Load% = 1 - 9.8/10 = 2%

2.(c) (i) Satendra invested ₹50000 in debt-oriented fund when the NAV was ₹16.10, and sold the units allotted when the NAV was ₹ 17.10 after one year. Assume that there existed an entry load of 2% and no exit load. He received ₹ 2 per unit as dividend which is taxable at 30% during the year. Ignore capital gains tax. What is the after tax rupee return from this investment? [5]

2.(c) (ii) NBFC are not being compulsorily registered with RBI. - Justify. [3]

Answer to 2(c)(i):

Satendra invested ₹50000, when NAV was ₹16.10 and the sale price was = 16.10 x 1.02 = ₹ 16.4220. At this price he was issued 3044.70 (50000/16.422) units. On this he received dividend = 3044.7 x 2 = ₹6089.40. However, dividends are taxable at 30%. His post tax receipt - 4262.58. Now if he sells after a year when the NAV is ₹17.10, he gets full value as there is no exit load.

Rupee return in value

= (Post Tax Div. + (Repurchase Price - Sale Price) x No. of Units

= 4262.58 + (17.10 - 16.422) x 3044.7

= 6326.89

Rupee return in %

= 6326.89/50000

= 12.65%

Answer to 2(c)(ii):

In terms of Section 45-IA of the RBI Act, 1934, no Non-banking Financial company can commence or carry on business of a non-banking financial institution without a) obtaining a certificate of registration from the Bank and without having a Net Owned Funds of ₹ 25 lakhs (₹ two crore since April 1999). However, in terms of the powers given to the Bank. to obviate dual regulation, certain categories of NBFCs which are regulated by other regulators are exempted from the requirement of registration with RBI viz. Venture Capital Fund/Merchant Banking companies/Stock broking companies registered with SEBI, Insurance Company holding a valid Certificate of Registration issued by IRDA, Nidhi companies as notified under Section 620A of the Companies Act, 1956, Chit companies as defined in clause (b) of Section 2 of the Chit Funds Act, 1982, Housing Finance Companies regulated by National Housing Bank, Stock Exchange or a Mutual Benefit company.

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

Answer to 2(d)(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.

Answer to 2(d)(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 it.

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

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

3. (a) 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 to 3(a):

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%

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 to 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)

1.14 = 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

Answer to 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) (i) The following quotes are available.

Spot ($/Euro)	**0.8385/0.8391**
3-m swap points	**20/30**
Spot ($/Pound)	**1.4548/1.4554**
3-m swap points	**35/25**

Find the 3-m (€/£) outright forward rates. **[5]**

3.(c) (ii) What is a swap? Explain its necessity. Also state financial benefits created by swap transactions. **[2+2+1]**

Answer to 3(c)(i)

Given $/€ = 0.8385 / 0.8391 3M fwd = 0.8405 / 0.8421
(Swap points ascending order ⟶ add to find forward rates)
$/£= 1.4548/1.4554 3M fwd = 1.4513 / 1.4529
(Swap points descending order ⟶ deduct to find forward rates)

To find € /£ (3M outright forward rates)
Bid (€/£) = Bid (€ /$) x Bid ($/£)

We do not have a quote of € /$, instead we have $/ €.

Bid (€ /£) = I/Ask($/€) x Bid($/£)

Substituting the values,

Bid rate for € /£= 1/0.8421 x 1.4513 = 1.7234

Similarly Ask (€ /£) = 1/Bid($/€) x Ask($/£)
= 1/0.8405x1.4529 = 1.7286

∴ 3M outright forward rates (€ /£) = 1.7234 / 1.7286

Answer to 3(c)(ii):

Swaps Exchange of one obligation with another -- Financial swaps are funding technique, which permit a borrower to access one market and exchange the liability for another market / instrument - exchange one type of risk with another.

Necessity –

1. Difference in borrowers and investors preference and market access
2. Low cost device
3. Market saturation
4. Differences in financial norms followed by different countries.

Financial Benefits Created by Swap Transactions

- The Theory of Comparative Advantage
- Information asymmetries.

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

4.(a)(i) Explain the financial meaning of investment? [4]

4.(a)(ii) An investor is holding 1,000 shares of Dream Land Company. Presently the dividend being paid by the company is ₹2 per share and the share is being sold at ₹25 per share in the market.

However several factors are likely to change during the course of the year as indicated below —

	Risk Free Rate	Market Risk Premium	Beta Value	Expected Growth Rate
Existing	**12%**	**6%**	**1.6**	**5%**
Revised	**10%**	**4%**	**1.45**	**9%**

In view of the above factors whether the investor should buy, hold or sell the shares? Why? [4]

Answer to 4(a)(i):

Financial Meaning of Investment

- Financial investment involves of funds in various assets, such as stock, Bond, Real Estate, Mortgages etc.
- Investment is the employment of funds with the aim of achieving additional income or growth in value.
- It involves the commitment of resources which have been saved or put away from current consumption in the hope some benefits will accrue in future. Investment involves long term commitment of funds and waiting for a reward in the future.
- From the point of view people who invest their finds, they are the supplier of 'Capital' and in their view investment is a commitment of a person's funds to derive future income in the form of interest, dividend, rent, premiums, pension benefits or the appreciation of the value of their principle capital.
- To the financial investor it is not important whether money is invested for a productive use or for the purchase of second hand instruments such as existing shares and stocks listed on the stock exchange.
- Most investments are considered to be transfers of financial assets from one person to another.

Answer to 4(a)(ii):

Particulars	Existing	Revised
Rate of Return = $R_f + \beta (R_m - R_f)$	= 12% + 1.6 x (6%) = 21.6%	= 10% +1.45 X (4%) =15.8%
Price of Share $P_0 = \frac{D(1+g)}{K_e - g}$	$= \frac{2\times(1.05)}{0.216-0.05} = \frac{2.10}{0.166} = 12.65$	$= \frac{2\times(1.09)}{0.158-0.09} = \frac{2.18}{0.068} = 32.06$
Current Market Price	₹25	₹25
Inference	Over-Priced	Under-Priced
Decision	**Sell**	**Buy**

4 (b). Shah Ltd., has been specially formed to undertake two investment opportunities. The risk and return characteristics of the two projects are shown below:

Project	Expected Return	Risk
P	**15%**	**3%**
Q	**22%**	**7%**

Shah Ltd. plans to invest 80% of its available funds in project P and 20% in Q. The directors believe that the correlation co-efficient between the returns of the projects is +1.0.
Required—

(1) Calculate the returns from the proposed portfolio of Projects P and Q.
(2) Calculate the risk of the portfolio;
(3) Suppose the correlation coefficient between P and Q was -1. How should the company invest its funds in order to obtain zero risk portfolio. [2+3+3]

Answer to 4(b):

(1) Return of the Portfolio

Securities	Expected return	Proportion	Return from portfolio
(1)	(2)	(3)	(4) = (2) x (3)
P	15	0.8	12
Q	22	0.2	4.4
Return of the Portfolio			16.4

(2) Basic Values of Factors for Determination of Portfolio Risk

Particulars	Notation	Value
Standard deviation of Security P	σ_P	3%
Standard deviation of Security Q	σ_Q	7%
Correlation co-efficient of Securities P and Q	ρPQ	+ 1
Weight of Security P	W_P	0.80
Weight of Security Q	W_Q	0.20

Risk of Portfolio i.e. Standard deviation of Portfolio of P and Q [80%: 20% Ratio]

$$\sigma PQ = \sqrt{\left(\sigma P^2 \times W_P^{\,2}\right) + \left(\sigma Q^2 \times W_Q^{\,2}\right) + 2\left(\sigma P \times W_P \times \sigma Q \times W_Q \times \rho PQ\right)}$$
$$= \sqrt{\left(3^2 \times 0.80^2\right) + \left(7^2 \times 0.20^2\right) + \left(2 \times 3 \times 0.80 \times 7 \times 0.20 \times 1\right)}$$
$$= \sqrt{\left(9 \times 0.64\right) + \left(49 \times 0.04\right) + \left(6.72\right)}$$

$$\text{Risk} = \sqrt{5.76 + 1.96 + 6.72} = \sqrt{14.44} = 3.8\%$$

(3) Computation of Investment in Security A and B (WA)

Proportion of Investment in Security P, $W_P = \dfrac{\sigma Q^2 - Cov_{PQ}}{\sigma P^2 + \sigma Q^2 - 2Cov_{PQ}}$

Proportion of Investment in Security Q, $W_Q = 1 - W_P$

$Cov_{PQ} = \rho PQ \times \sigma P \times \sigma Q$

$= - 1 \times 3 \times 7 = - 21$

$W_P = [\sigma Q^2 – Cov_{PQ}] \div [\sigma P^2 + \sigma Q^2 - 2Cov_{PQ}]$

$W_P = [7^2 – (–21)] \div [3^2+7^2 –2 \times (- 21)]$

$W_P = [49 + 21] \div [9 + 49 + 42]$

$W_P = 70 / 100 = 0.70$

Proportion of Investment in Security Q, $W_Q = 1 - W_P = 1 – 0.70 = 0.30$

4.(c) (i) What are the techniques used in Industry Analysis? [2]

4.(c) (ii) There are two portfolios L and M. known to be on the minimum various set for a population of three securities A, B and C. The weights for each of the portfolios are given below:

	WA	WB	WC
Portfolio L	**0.18**	**0.63**	**0.19**
Portfolio M	**0.24**	**0.60**	**0.16**

Ascertain the stock weights for a portfolio made up with investment of ₹ 3,000 in L and ₹ 2,000 in M. [4]

4.(c) (iii) The risk free return is 8 per cent and the return on market portfolio is 14 per cent. If the last dividend on Share 'A' was ₹2.00 and assuming that its dividend and earnings are expected to grow at the constant rate of 5 per cent. The beta of share 'A' is 2.50. Compute the intrinsic value of share A. [2]

Answer to 4(c)(i):

Techniques Used in Industry Analysis:

(i) Regression Analysis: Investor diagnoses the factors determining the demand for output of the industry through product demand analysis. The following factors affecting demand are to be considered - GNP, disposable income, per capita consumption / income, price elasticity of demand. These factors are then used to forecast demand using statistical techniques such as regression analysis and correlation.

(ii) Input - Output Analysis: It reflects the flow of goods and services through the economy, intermediate steps in production process as goods proceed from raw material stage through final consumption. This is carried out to detect changing patterns/trends indicating growth/decline of industries.

Answer to 4(c)(ii):

Particulars	WA	WB	WC	Total
Portfolio L	0.18	0.63	0.19	
Investment in securities				
(Weight x investment)	540	1,890	570	3,000
Portfolio M	0.24	0.60	0.16	
Investment in securities				
(Weight x investment)	480	1,200	320	2,000
Total investment in securities	1,020	3,090	890	5,000
Weight in portfolio	0.204	0.618	0.178	

Weight in portfolio is computed as total securities/size of portfolio; for example weight of securities A is 1,020/5,000 = 0.204, similar for B and C.

Answer to 4(c)(iii):

Computation of Expected Return

Expected Return $[E(R_A)] = R_F + [\beta_A \times (R_M - R_F)]$

$= 0.08 + [2.5 \times (0.14 - 0.08)]$

$= 0.08 + 2.5\ (0.14 - 0.08) = 0.08 + 0.15 = 0.23$

i.e., $K_e = 23\%$

Intrinsic Value of share $= D1 \div (K_e - g) = D_0 X\ (1+ g) \div (K_e - g)$

$= 2 \times (1+0.05) \div (0.25 - 0.05) =$ ₹ 11.67

The Intrinsic Value of share A is ₹ 11.67.

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

5. (a) (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 ₹150000 and will last for 3 years. It costd ₹40000 per year to run. Machine B is an economy model costing only ₹100000 but will last only for 2 years and costs ₹60000 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 10%. Which machine Company Z should buy? [6]

5 (a)(ii) Write a note on financial forecasting. [4]

Answer to 5(a)(i):

Compound present value of 3 years @ 10% = 2.486
P.V. of running cost of Machine A for 3 years = ₹40000 x 2.486 = ₹99,440.
Compound present value of 2 years @ 10% = 1.735
P.V. of running cost of Machine B for 2 years = ₹60000 x 1.735 = ₹104100.

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	99,440	1,04,100
P.V. of cash outflow	2,49,440	2,04,100
Equivalent present value of annual cash outflow	2,49,440	2,04,100
	2.486	1.735
	1,00,338	1,17,637

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

Answer to 5(a)(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.

5. (b) A company wish to acquire an asset costing ₹1,00,000. The company has an offer from a bank to lend @ 18%. The principal amount is repayable in 5 years end installments. A leasing Company has also submitted a proposal to the Company to acquire the asset on lease at yearly rentals of ₹ 280 per ₹ 1,000 of the assets value for 5 years payable at year end. The rate of depreciation of the asset allowable for tax purposes is 20% on W.D.V with no extra shift allowance. The salvage value of the asset at the end of 5 years period is estimated to be ₹1,000. Whether the Company should accept the proposal of Bank or leasing company, if the effective tax rate of the company is 50%? The Company discounts all its cash flows at 18%. [10]

Answer to 5 (b):

I. <u>Borrowing Option:</u>

(Amount in ₹)

Year	Principal	Interest @ 18% p.a.	Depreciation @ 20% on W.D.V.	Tax shield (3)÷(4)50%	Net cash flow (2)÷(3)–(5)	Discount Rate@18%	Discounted Cash Flows (6)x(7)
1 (₹)	**2 (₹)**	**3 (₹)**	**4 (₹)**	**5 (₹)**	**6 (₹)**	**7 (₹)**	**8 (₹)**
1	20,000	18,000	20,000	19,000	19,000	0.847	16,093
2	20,000	14,400	16,000	15,200	19,200	0.718	13,786
3	20,000	10,800	12,800	11,800	19,000	0.609	11,571
4	20,000	7,200	10,240	8,720	18,480	0.516	9,536
5	20,000	3,600	8,192	5,896	17,704	0.437	7,736
5	(1,000)	---	31,768*	15,884	(16,884)	0.437	(7,378)
Present value of Total Cash out flow							**51,350**

*WDV at the end of 5 years shall be ₹ 32,768. Deducting there from the salvage value of ₹ 1,000 the capital loss claim will be ₹ 31,768.

II. Leasing Option:

(Amount in ₹)

Year	Lease Rentals (₹)	Tax shield (₹)	Net Cash Flows (₹)	Discount Rate @ 18%	Discounted Cash Flows (₹)
1	28,000	14,000	14,000	0.847	11,858
2	28,000	14,000	14,000	0.718	10,052
3	28,000	14,000	14,000	0.609	8,526
4	28,000	14,000	14,000	0.516	7,224
5	28,000	14,000	14,000	0.437	6,118
Discounted after tax cost					**43,778**

Advise: By making analysis of both the alternatives, it is observed that the Present value of the Cash Outflow is lower in alternative II by ₹ 7,572 (i.e. 51,350 – 43,778). Hence it is suggested to acquire the asset on lease basis.

5 (c). Khan limited company operates a lodging house with a restaurant, shops and recreational facilities attached. Its manager has entrusted you with the planning of the coming year's operations, more particularly on the level of profits the company was likely to earn. The lodging house has 100 double- bed rooms, which are likely to be rented at ₹ 150 per day. The manager expects an occupancy ratio of 70% for a period of 250 days during the tourist season. It is also anticipated that both the beds in a room will be occupied during the period. Each person staying in the lodging house is expected to spend, on the basis of past statistics, ₹ 30 per day in the shops attached to the lodge and ₹ 60 per day in the restaurant. The recreational facilities are not charged to the customer.

Some other relevant data available to you is as under:

I. Variable cost to volume ratio:

	Shops	Restaurant
Cost of goods sold	**40%**	**30%**
Supplies	**5%**	**15%**
Others	**5%**	**10%**

II. For the lodging house, the variable costs are ₹ 25 per day per occupied room for cleaning, laundry etc.

III. Annual fixed costs for the entire complex are ₹ 19,50,000.

From the above, you are required to prepare:

(1) An income statement for the coming year; and

(2) An analysis to indicate whether the manager's suggestion of reducing the room rent to ₹ 120 per day to enhance the occupancy ratio to 80% should be accepted. [5+5]

Answer to 5 (c):

(a) Expected Income Statement of Khan Ltd. Company

(A) Revenue:		**₹**
Hotel Room receipts (100 rooms x 250 days x ₹ 150 x 70%)		26,25,000
Shops (100 rooms x 2 persons x 250 days x ₹ 30 x 70%)		10,50,000
Restaurant (100 rooms x 2 persons x 250 days x ₹ 60 x 70%)		21,00,000
		57,75,000
(B) Variable costs:	**₹**	**₹**
Hotel Room (100 rooms x 250 days x ₹ 25 x 70%)	4,37,500	
Shops (₹ 10,50,000 x 50%)	5,25,000	
Restaurant (₹ 21,00,000 x 55%)	11,55,000	21,17,500
(C) Contribution (A – B)		36,57,500
Less: Fixed costs		19,50,000
Expected profits		**17,07,500**

(b) Income Statement based on Manger's suggestions

(A) Revenue:		**₹**
Hotel Room receipts (100 rooms x 250 days x ₹ 120 x 80%)		24,00,000
Shops (100 rooms x 2 persons x 250 days x ₹ 30 x 80%)		12,00,000
Restaurant (100 rooms x 2 persons x 250 days x ₹ 60 ₹ 80%)		24,00,000
		60,00,000
(B) Variable costs:	**₹**	**₹**
Hotel Room (100 rooms x 250 days x ₹ 25 x 80%)	5,00,000	
Shops (₹ 12,00,000 x 50%)	6,00,,000	
Restaurant (₹ 24,00,000 x 55%)	13,20,000	24,20,000
(C) Contribution (A – B)		35,80,000
Less: Fixed costs		19,50,000
Profits		**16,30,000**

Comment: The profit based on manager's suggestion ₹ 16,30,000 is lower than the expected profit ₹ 17,07,500, therefore, it is advisable that the manager's suggestion of reducing the room rent to ₹ 125 per day to enhance the occupancy ratio to 80% should not be accepted.