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) A company has expected Net Operating Income – ₹ 2,40,000; 10% Debt – ₹7,20,000 and Equity Capitalisation rate - 20% what is the weighted average cost of capital for the company? **[2]**

Answer to (a):

Market value of equity (S) = $\frac{2,40,000 - 72000(I)}{0.20} = 840000$

Total value of firm (V) = S + D = 840000 + 720000 = 1560000

$K_0 = \frac{NOI}{V} = \frac{240000}{1560000} = 0.15385$

(b) Write the objectives of the takeout finance scheme? **[2]**

Answer to (b):

(i) To boost the availability of longer tenor debt finance for infrastructure projects.

(ii) To address sectoral / group / entity exposure issues and asset-liability mismatch concerns of Lenders, who are providing debt financing to infrastructure projects.

(iii) To expand sources of finance for infrastructure projects by facilitating participation of new entities i.e. medium / small sized banks, insurance companies and pension funds.

(c) A security whose standard deviation is 3.0 percent, the correlation coefficient for the security with the market is 0.8 & the market standard deviation is 2.2 percent. The return from government securities is 5.2% and from the market portfolio is 9.8%. What is the required return on the security? **[2]**

Answer to (c):

$\beta = \frac{\sigma s \times rsm}{\sigma m} = \frac{0.03 \times 0.8}{0.022} = 1.091$

Calculation of Required Rate of Return on Security

$K_e = R_f + \beta(R_m - R_f)$ = 5.2% + 1.091 (9.8% - 5.2%) = 5.2%+5.02% = 10.22%

(d) What do you mean by butterfly spread? [2]

Answer to (d):

Butterfly Spread is an option strategy which combines a Bull Spread and Bear Spread and involves three different strike prices.
Butterfly spread is taken up if investors are of the view that the underlying security is not highly volatile and there is not going to be a substantial rise or fall in its prices.

(e) Star Ltd. is planning a commercial paper issue of ₹25 lakh. Given the following details, you are required to calculate the issue price of commercial paper. [2]

Face Value	**=₹25 lakh**
Maturity period	**= 3 months**
Effective interest p.a.	**= 10.5%**

Answer to (e):

$$\text{Issue price} = \frac{F}{1+\left[\frac{i}{100}\times\frac{N}{365}\right]}$$

Where,

Given F = Face Value = ₹25 lakhs,
I=Effective Interest = 10.5%,
N = Issuance Period = 3 months i.e 90 days
and P = ?

$$= \frac{₹25,00,000}{1+\left[\frac{10.5}{100}\times\frac{90}{365}\right]}$$

P = ₹24.36 lakhs approx.

(f) The stock of Dhanlaxmi Ltd. (FV ₹ 10) quotes ₹ 520 on NSE ad the 3 months futures price quotes at ₹ 532. The borrowing rate is given as 15% p.a. What would be the theoretical price of 3 month Dhanlaxmi Future if the expected annual dividend yield is 25% p.a. payable before expiry? [2]

Answer to (f):

Theoretical Price of 3 month Dhanlaxmi Futures:

Sport + Cost of Carry – Dividend.

= 520 +520 × 0.15 × 0.25 – 2.50 (25% of FV ₹ 10)

=520 + 19.50 – 2.50 = ₹ 537.

(g) Define security receipts. [2]

Answer to (g):

Security Receipts: Security receipt means a receipt or other security, issued by a securitisation company or reconstruction company to any qualified institutional buyer pursuant to a scheme, evidencing the purchase or acquisition by the holder thereof, of an undivided right, title or interest in the financial asset involved in securitisation.

(h) Aptex Ltd. has both European call and put options traded on NSE. Both options have an expiration date 6 months and exercise price of ₹ 30. The call and put are currently selling for ₹ 4 respectively. If the risk free rate of interest is 6% p.e., what would be the stock price of Aptex Ltd.? [Given PVIF (6%, 0.5 yrs) = 0.9709]. [2]

Answer to (h):

According to Call-Put parity

C0 = P0 + S0 – PV(E) Where C = 10, P = 4

10 = 4 + S0 – 30 × 0.9709 PV (E) = PV of Exercise Price

So = 10 -4 + 29.127

= 35.127 i.e. ₹ 35.13.

(i) The P/V ratio of a firm dealing in precision instruments is 50% and margin of safety is 40%. Calculate net profit, if the sales volume is ₹ 50,00,000. [2]

Answer to (i):

Margin of Safety	= 50,00,000@40%	= ₹2000000
BEP Sales	= 50,00,000 – 20,00,000	= ₹30,00,000
Fixed cost	= BEP (s)× p/v ratio	= 30,00,000@50% = 1500000
Contribution	= 5000000 x 50/100	= ₹2500000
Profit	= 25,00,000 – 15,00,000	= ₹10,00,000

(j) Samar Ltd. has an excess cash of ₹ 8,00,000 which it wants to invest in short-term marketable securities. Expenses relating to investment will be ₹ 20,000. If the securities invested will have an annual yield of 9%, what would be the period of investment so as to earn a pre-tax income of 5%? (Ignore time value). [2]

Answer to (j):

Pre-tax Income required as investment of ₹ 8,00,000

= ₹ 8,00,000 × 0.05 = ₹ 40,000

Let the period of investment be: P

(8,00,000 × 0.09 × P/12) – 20,000 = 40,000

or, 6,000 P = ₹ 60,000

P = 60,000 ÷ 6,000 = 10 months.

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

2 (a)(i). Describe the key reasons to invest in infrastructure in India. [4]

Answer to 2(a)(i):

The key reasons to invest in infrastructure in India are as follows:

(1) 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.

(2) 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.

(3) 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.

(4) 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.

2 (a)(ii). The following portfolio details of a fund are available:

Stock	Shares	Price (₹)
A	**200000**	**35**
B	**300000**	**40**
C	**400000**	**20**
D	**600000**	**25**

The fund has accrued management fees with the portfolio manager totaling ₹30000. There are 40 lakhs shares outstanding. What is the NAV of the fund? If the fund is sold with a front end load of 5%, what is the sale price? [3+1]

Answer to 2(a)(ii):

The following portfolio details of a fund are available:

Stock	Shares	Price (₹)	Value
A	200000	35	70,00,000
B	300000	40	1,20,00,000
C	400000	20	80,00,000

D	600000	25	1,50,00,000
Total			4,20,00,000

NAV of the fund = (4,20,00,000-30,000)/40,00,000 = ₹ 10.4925
Sale Price = NAV (1+ Load %)
= 10.4925*(1.05) = ₹11.02 approx.

2 (b). Evaluate performance of Funds M, N and the Market Portfolio from the following information available for the past six months —

Month (Return %)	Apr	May	Jun	Jul	Aug	Sep
Fund M	3.25	1.50	(1.00)	3.75	1.25	0
Fund N	2.50	(1.25)	0	2.75	2.25	1.25
Market Portfolio	1.00	(0.75)	2.00	1.75	0.25	3.25

The 6 Month Treasury Bills carry an interest rate of 6% p.a. [8]

Answer to 2 (b):

(1) Computation of Factors

Month	Fund M		Fund N		Market portfolio	
	Return	Risk of Loss	Return	Risk of Loss	Return	Risk of Loss
(1)	(2)	(3)= (2) - 0.50 [if (2)<0.50]	(4)	(5)= (4) - 0.50 [if (4)<0.50]	(6)	(7)= (6) - 0.50 [if (6)<0.50]
Apr	3.25	0.00	2.50	0.00	1.00	0.00
May	1.50	0.00	(1.25)	1.75	(0.75)	1.25
Jun	(1.00)	1.50	0.00	0.50	2.00	0.00
Jul	3.75	0.00	2.75	0.00	1.75	0.00
Aug	1.25	0.00	2.25	0.00	0.25	0.25
Sep	0.00	0.50	1.25	0.00	3.25	0.00
Total	8.75	2.00	7.50	2.25	7.50	1.50
Average	1.46 (8.75/6)	0.33 (2.00/6)	1.25 (7.50/6)	0.38 (2.25/6)	1.25 (7.50/6)	0.25 (1.50/6)

Monthly Risk Free Return = 6% p.a. ÷ 12 = 0.50% p.m.

(2) Computation of Morning Star Index (MSI)

Particulars	Fund M	Fund N	Market Portfolio
Average Monthly Return [A]	1.46%	1.25%	1.25%
Average Monthly Risk of Loss [B]	0.33%	0.38%	0.25%
Morning Star Index (i.e. Excess Return) [A] - [B]	1.13% [1.46% -0.33%]	0.87% [1.25% -0.38%]	1% [1.25% -0.25%]
Ranking	**1**	**3**	**2**

Evaluation: Fund M has performed better than the Market Portfolio, while Fund N has not performed as good as the Market Portfolio despite having the equivalent average return during the period.

2 (c)(i). Nomination facility available to the Depositors of NBFCs. - Justify. [3]

Answer to 2(c)(i):

Yes, nomination facility is available to the depositors of NBFCs. The Rules for nomination facility are provided for in section 45QB of the Reserve Bank of India Act, 1934. Non-Banking Financial Companies have been advised to adopt the Banking Companies (Nomination) Rules, 1985 made under Section 45ZA of the Banking Regulation Act, 1949. Accordingly, depositor/s of NBFCs are permitted to nominate one person to whom the NBFC can return the deposit in the event of the death of the depositor/s. NBFCs are advised to accept nominations made by the depositors in the form similar to one specified under the said rules, viz Form DA 1 for the purpose of nomination, and Form DA2 and DA3 for cancellation of nomination and change of nomination respectively.

2 (c)(ii). The RBI offers 91-day T-Bill to raise ₹ 5000 Crores. The following bids have been received.

Bidder	Bid rate	Amount (₹ Crores)
A	**98.95**	**1,800**
B	**98.93**	**700**
C	**98,92**	**1,000**
D	**98.90**	**1,200**
E	**98.90**	**600**
F	**98.87**	**200**
G	**98.85**	**350**
H	**98.85**	**150**

(1) Who are the winning bidders if it was a yield based auction, and how much of the security will be allocated to each winning bidder?

(2) If this auction is single price auction, that is the price to be paid by the winning bidders? [3+2]

Answer to 2(c)(ii):

(1) Fully accepted bids will be as follows:

Bidder	Price Quoted	Approved Amount (₹) Crores)
A	98.95	1800
B	98.93	700
C	98.92	1000
	Total	3500

D and E will be allotted proportionately in the following manner:

Bidder	Price	Amount	Proportionate amount allotted (₹ Crores)
D	98.90	1200	1000
E	98.90	600	500
		1800	1500

(2) Had this been a single price auction, the price to be paid by the winning bidder would be ₹ 98.90. Because starting from ₹ 98.95, in the descending order of price (i.e. in the ascending order of yield) ₹ 5000 crores can be collected by accepting bids upto ₹ 98.90. [Find cumulative total from 98.95 till 98.90 downwards/descending.]

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

Answer to 2(d)(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.

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

Answer to 2(d)(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.

2 (d)(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(d)(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%

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

3 (a)(i). Draw a relationship between call option and put option in put-call parity theory. [4]

Answer to 3(a)(i):

Options are the most important group of derivative securities. A call option gives the holder the right to buy an asset at a specified date for a specified price whereas in put option, the holder gets the right to sell an asset at the specified price and time.

'Put-Call Parity theory' is the relationship between the price of the European Call Option and Put Option, when they have the same strike price and maturity date, namely that a Portfolio of long a call option and short a put option is equivalent to a single forward contract at the strike price and expiry. This is because if the price at expiry is above the strike price, the call will be exercised, while it is below, the put will be exercised. Thus, in either case, one unit of the asset will be purchased for the strike price, exactly as in a forward contract.
Theory:
C+ PV of EP = SP + P, Where, C = Call option premium; EP = Exercise price; SP = Current stock price; and P = Put option premium.

3 (a)(ii). An Indian customer who has imported equipment from Germany has approached a bank for booking a forward Euro contract. The delivery is expected six months from now. The following rates are quoted:
($/Euro) spot 0.8453/0.8457
6m-Swap points 15/20
₹/$ spot 46.47/46.57
6m-Swap points 20/30
What rate the bank will quote, if it needs a margin of 0.5%? [6]

Answer to 3 (a)(ii):

For arriving at a quote the bank has to calculate outright forward rates keeping in to consideration the margin of 0.5% as follows:

$/∈ 6m Forward Rates:
Bid rate = 0.8453+0.0015=0.8468
Offer rate = 0.8457+0.0020=0.8477

$/₹ 6m Forward rates
Bid rate = 46.47+0.20=46.67
Offer rate = 46.57+0.30=46.87

In the instant case, the customer needs e to pay for imports. He would purchase euros. Therefore he needs a quote of Euro in Rupee terms. Hence, we therefore need to find only ask quote.
(₹/∈) = (₹/$) x ($/∈) = 0.8477 x 46.87
The Bank would quote ₹ 39.73 + 0.5% = ₹ 39.93/∈

3 (b). The equity share of Softex Ltd., is quoted at ₹ 210. A 3-month call option is available at a premium of ₹ 6 per share and a 3-month put option is available at a premium of ₹ 5 per share.

(i) Ascertain the next pays-offs to the option holder of a call option and a put option, given that:

(1) The strike price in both cases is ₹ 220; and

(2) The share price on the exercise day is ₹ 200, ₹ 210, ₹ 220, ₹ 230 and ₹ 240 respectively.

(ii) Also indicate the price range at which the call and the put options may be gainfully exercised. [4+4+2]

Answer to 3 (b):

SOFTEX LTD.

NET PAY-OFF FOR THE HOLDER OF THE CALL OPTION (₹)					
Share price on Exercise Day	200	210	220	230	240
Option Exercise	No	No	No	Yes	
Outflow (Strike Price)	Nil	Nil	Nil	220	
Outflow (Premium)	6	6	6	6	
Total Outflow	6	6	6	226	
Less: Inflow (Sales proceeds)	0	0	0	230	
Net Pay-off [Gain/Loss)]	15	5	(5)	(5)	

NET PA Y-OFF FOR THE HOLDER OF THE PUT OPTION (₹)					
Share price on Exercise Day	200	210	220	230	240
Option Exercise	Yes	Yes	No	No	
Inflow (Strike Price)	220	220	Nil	Nil	
Less: Outflow (Purchase)	200	210	0	0	
Less: Outflow (Premium)	5	5	5	5	
Net Pay-off [Gain/Loss)]	15	5	(5)	(5)	

Comments:

The loss of the option holder is restricted to the amount of Premium paid. The (positive pay-off) depends on the difference between the strike price and the share price on the exercise day.

In case of call option, the investor will be benefitted if the actual price exceeds ₹ 226. In case of Put option, the investor will be benefitted if the actual price is less than ₹ 215.

3 (c)(i). State the term "Contango" and "Backwardation" as used with respect to Future Contracts. [3]

Answer to 3(c)(i):

Although the spot price and futures price generally move in line with each other, the basis is not constant. Usually basis decreases with time, until on the date of expiry the basis is zero and futures price equals spot price.

Contango: If the futures price is greater than the spot price it is called contango.
Under normal market conditions futures contracts are priced above spot price. This is known as contango market. In this case, the futures price tends price tends to fall over time towards the spot price, equaling spot on the day of delivery.

Backwardation: If the spot price is greater than the futures price it is called backwardation. In this case futures price tends to rise over time to equal the spot price on the day of delivery.

3 (c)(ii). What are the principle weaknesses of Indian Stock Market? [3]

Answer to 3(c)(ii):

The principle weaknesses of Indian Stock Market are enumerated below:

(1) Scarcity of floating stock: Financial Institutions, banks and insurance companies own 80% of the equity capital of the private sector.
(2) Speculation: 80% of the transactions on the NSE and BSE are speculative in nature.
(3) Price rigging: Evident in relatively unknown and low quality scripts-causes short-term functions in the price.
(4) Insider trading: obtaining market sensitive information to make money in the markets.

3 (c)(iii). The following information is available for a call option:

Time to Expiration	**: 3 months**
Risk-free Rate	**: 8%**
Exercise Price	**: ∈65**
Stock Price	**: ∈ 70**
Call Price	**: ∈ 12**

You are required to calculate value of put option. [4]

Answer to 3(c)(iii):

According to Put-call Parity theorem

$$P_0 = C_0 + \frac{E}{e^{rt}} S_0$$

$$= \in 12 + \frac{65}{e^{08\times25}} - \in 70$$

$$= \in 12 + \frac{65}{1.0202} - \in 70$$

$= \in$l2+ 63.71 - $\in$70 = $\in$ 5.71

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

4 (a). Shahid has invested in four securities A, B, C and D, the particulars of which are as follows

Security	Amount Invested (₹)	Beta (β)
A	1,25,000	0.60
B	1,50,000	1.50
C	80,000	0.90
D	1,45,000	1.30

If RBI Bonds carries an interest rate of 8% and nifty yields 14%, what is the expected return on portfolio? If investment in Security C is replaced by investment in RBI Bonds, what is the corresponding change in Portfolio Beta and expected return? [4+4]

Answer to 4 (a):

(1) Computation of Expected Return on Portfolio (Under CAPM)

I. Computation of Weighted Beta (Beta of the Portfolio)

Security	Amount Invested (₹)	Proportion of Investment to Total Investment	Beta of Investment	Weighted Beta
(1)	(2)	(3) = (2) ÷ 5,00,000	(4)	(5) = (3) x (4)
A	1,25,000	0.25	0.60	0.150
B	1,50,000	0.30	1.50	0.450
C	80,000	0.16	0.90	0.144
D	1,45,000	0.29	1.30	0.377
Total	5,00,000	1.00		1.121

II. Computation of Expected Return on Portfolio:

Expected Return $[E(R_P)] = R_f + \beta_P \times (R_m - R_f)$

$= 8\% + [1.121 \times (14\% - 8\%)]$

$= 8\% + [1.121 \times 6\%] = 8\% + 6.726\% = 14.726\%$

(2) Computation of Expected Return [Investment in C, replaced by RBI Bonds] (CAPM)

I. Computation of Weighted Beta (Beta of the Portfolio)

Security	Amount Invested	Proportion of Investment to Total Investment	Beta of Investment	Weighted Beta
(1)	(2)	(3) = (2) 4- 5,00,000	(4)	(5) = (3) X
A	1,25,000	0.25	0.60	0.150
B	1,50,000	0.30	1.50	0.450
RBI Bonds	80,000	0.16	0.00	0.000
D	1,45,000	0.29	1.30	0.377
Total	**5,00,000**	**1.00**		**0.977**

II. Computation of Expected Return on Portfolio:

Expected Return $[E(R_P)] = R_f + \beta_P \times (R_m - R_f)$

$= 8\% + [0.977 \times (14\% - 8\%)]$

$= 8\% + [0.977 \times 6\%] = 8\% + 5.862\% = 13.862\%$

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

Answer to 4(b)(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.

4 (b)(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(b)(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 (c). 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(c):

(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, $W_Q = 1 - W_P = 1 - 0.70 = 0.30$

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

5 (a). 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 (a):

I. Borrowing Option:

(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 (b)(i). Define forfaiting. Write down the features of forfaiting. [1+5]

Answer to 5(b)(i):

Forfaiting: Forfaiting refers to the exporter relinquishing his right to a receivable due at a future date in exchange for immediate cash payment, at an agreed discount, passing all risks and responsibilities for collecting the debt to the Forfaiter.

Features:

(1) Forfaiting is a form of financing of receivables pertaining to International Trade.
(2) It is the discounting of international trade receivables on a 100% "without recourse" basis.
(3) It denotes the purchase of trade bills/ promissory notes by a Bank / Financial Institution without recourse to the Seller.
(4) The purchase is in the form of discounting the documents covering entire risk of non-payment in collection.
(5) Forfaiting transforms the supplier's credit granted to the importer into cash transaction for the exporter, protecting him completely from all the risks associated with selling overseas on credit.

5 (b)(ii). A company is considering raising funds of about ₹100 Lakhs by one of two alternative methods, viz. 14% Substitutional Tern Loan and 13% Non-Convertible Debentures. The term loan option would attract no major accidental cost. The Debentures would be issued at a discount of 2.5% and would involve cost of issue ₹1 lakh. Advice the company as to the better option based on effective cost of capital. Assume a tax rate of 50%. [4]

Answer to 5(b)(ii):

(₹ in Lakhs)

Mode	**Term Loan**	**Debentures**
Gross Realisation	100.00	100×97.5%=97.50
Less:Cost of Issue	–	1.00
Net Proceeds	**100.00**	**96.50**
Interest Payable at 14% and 13% of Face Value	14.00	13.00
Interest × After tax rate=Annual Payout	7.00	6.50
$\text{Effective } K_d = \frac{\text{Interest(after tax)}}{\text{Net Proceeds}}$	7%	6.74%
Ranking	**II**	**I**

Note: Based on Effective K_d, Debentures can be preferred. But net realisation is only ₹ 96.5 Lakhs. If fund requirement of ₹100 Lakhs is considered as the base, the Face Value of Debentures to be issued. [₹100 Lakhs (Net Proceeds) + ₹1 Lakh (Cost of Issue)] + ₹ 2.5 (issued at a discount). Hence, Face Value of Debentures issued ₹103.59 Lakhs approximately. Effective Cost of Debentures in that case = **6.73%**.

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.