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) XYZ & Co. has 20,000 equity shares of ₹10 each fully paid. The current market price per share is ₹20. Earnings available to the shareholders at the end of the period under consideration are ₹60,000. Calculate cost of equity share capital using earnings/price ratio. [2]

Answer to (a):

$$\text{Earning per share} = \frac{₹\ 60,000}{20,000} = ₹3$$

Current Market Price per share= ₹ 20

$$\text{Cost of Equity Capital} = \frac{\text{Earnings per share}}{\text{Current Market Price}}$$

$$= \frac{₹\ 3}{₹\ 20} = 15\%$$

(b) Immense Regional Disparities is a key reason to invest in infrastructure in India- Justify. [2]

Answer to (b):

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.

(c) The standard deviation of Greaves Ltd. stock is 24% and its correlation coefficient with market portfolio is 0.5. The expected return on the market is 16% with the standard deviation of 20%. If the risk-free return is 6%, calculate the required rate of return on Greaves Ltd. script. [2]

Answer to (c):

R_f (risk free return) as 6%
R_m (Market return) as 16%
σ_m (standard deviation of market return) as 20%.

σ_g (standard deviation of Greaves stock) as 24%,
And P_{gm} (correlation coefficient of Greaves stock) and then use the CAPM formula for the required return on Greaves stock.

Beta of Greaves stock = $\frac{P_{gm} \times \sigma_g \times \sigma_m}{(\sigma_m)^2} = \frac{0.5 \times 0.24 \times 0.20}{(0.20)^2} = 0.6$

The required return = $R_f + \beta_g (R_m - R_f) = 6\% + 0.6 (16 - 6) = 12\%$

(d) The six months Forward Price of a security is ₹ 208.18. The rate of borrowing is 8% per annum payable at monthly rates. Calculate the Spot Price of the security. [2]

Answer to (d):

$$FR = SP_o \times \left(1 + \frac{r}{m}\right)^{n \times m}$$

Therefore, ₹ 208.18 $= SP_o \times \left(1 + \frac{8\%}{12}\right)^{\frac{1}{2} \times 12}$

$= SP_o \times (1+0.67\%)^6 = SP_o \times (1+0.0067)^6 = SP_o \times (1.0067)^6$

₹ 208.18 $= 1.0409\ SP_o$

$SP_o = \frac{₹208.18}{₹1.0409} = ₹200$

(e) State the Banking Financial Institutions. [2]

Answer to (e):

Banking institutions are those institutions, which participate in the economy's payment system, i.e., they provide transaction services. Their deposits liabilities constitute a major part of the national money supply and they can, as a whole, create deposits or credit, which is money.

(f) Suppose that 1 French Franc could be purchased in the Foreign Exchange Market for 20 US cents today. If the Franc appreciated by 10% tomorrow against the dollar, how many Francs would a Dollar buy tomorrow? [2]

Answer to (f):

1 Franc = 0.2 US $. Currency appreciation of francs is 10%.
Therefore, 1 Franc = 0.2 × 1.1 = 0.22 US $.
One Dollar would buy, 1US $ = 1/0.22 = 4.5455 French francs.

(g) Mr. Khan purchased 300 units of a MUTUAL FUND at a price of ₹25 per unit at the beginning of the year. He paid a front-end load of 5%. The expense ratio of the fund is 2%. The growth rate in fund's security is 15 % during the year. Calculate the rate of Return of the fund if security sold at the end of the year. [2]

Answer to (g):

Market Value of Investment : 300 × 25 = ₹7,500

Purchase rate of Unit : 25 × 1.05 = ₹ 26.25

Total Purchase Consideration: 26.25 × 300 = ₹7,875

Increase in value : 300 × 25 × 0.15 = ₹1,125

Expense : 0.02 × 300 × 25 = ₹150

Rate of Returns : $\frac{1,125-150}{7,875} \times 100 = 12.38\%$

(h) Six months T-bills have a nominal rate of 7 percent, while default – free Japanese bonds that mature in 6 months have a nominal rate of 5.5 percent. In the spot exchange market 1 yen equals $ 0.009. If interest rate parity holds, calculate the six months forward exchange rate.

[2]

Answer to (h):

Under Interest Rate Parity Theory,

6-Months Forward = Spot Rate × (1+ Interest Rate on T bills) ÷ (1 + Interest Rate on Japanese Bonds)

= (1.035//1.0275) × 0.009

= 0.00907

(i) Calculate the expected rate of return of the security (K_e) from the following information:

Beta of a security	**0.5**
Expected rate of return on market portfolio	**15%**
Risk-free rate of return	**0.06**

If another security has an expected rate of return (K_e) of 18%, what should be its beta? [1+1]

Answer to (i):

$\beta = 0.5$

$R_M = 15\%$

$R_f = 0.06 = 6\%$

$K_e = R_f + \beta(R_M - R_f)$

$= 6\% + 0.5(15\% - 6\%) = 10.5\%$

$18\% = 6\% + \beta(15\% - 6\%)$

$12\% = \beta(9\%)$

$\beta = 1.33$

(j) The characteristics of two securities A and B are as follows:

Particulars	Security A	Security B
Expected Return (%)	12	13
Standard deviation of return (%)	21	29
Beta (β)	1.10	1.20

The correlation co-efficient between the return on Securities A and B is 0.94. If variance of returns on the market index is 400%, calculate the systematic risk of a portfolio consisting of two securities in equal proportion. [2]

Answer to (j):

The Beta of portfolio consisting of two securities given that money is allotted equally between two assets.
= 1.10 × 0.5 + 1.20 × 0.5
= 1.15

The Systematic Risk of a portfolio = $\beta^2 \sigma_m^2$
= $(1.15)^2$ × 400
= 529%

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

2 (a). A 3 day repo is entered into on July 10, 2015 on an 11.99% 2019 security, maturing on April 7, 2019. The face value of the transaction is ₹ 3 Crores. The price of the securities is ₹ 116.42. If the repo rate is 7%, calculate the settlement amount on July 10, 2015 and settlement amount on July 13, 2015. Assume that PNB has lent securities in the first leg to RBI. Calculate the cost of 3-day repo to PNB. [Use 360 day convention] [3+3+2]

Answer to 2(a):

In the first leg PNB lends securities and receives money from RBI

Stage I
G Sec pays bi-annual coupons;
G Sec Maturity on April 7, 2019;
Last interest paid on April 7, 2015;
Days elapsed from April 8, 2015 till July 10, 2015= 23+31+30+9 =93 days
Accrued Interest: 3 Crores × 0.1199 × 93/360 = ₹ 9,29,225
Transaction Value = ₹ 3 Crores × 116.42/100 = ₹ 3,49,26,000
Total Settlement amount = ₹ 3,58,55,225 = Money received by PNB from RBI

Stage II
After 3 days, securities returned to PNB & RBI receives money with repo interest.
Accrued Interest: 3 Crores × 0.1199 × 96/360 = ₹ 9,59,200
Repo Interest = Interest on Borrowed Amount = ₹ 3 Crores × 0.07 × 3/360 = ₹ 17,500

Transaction Value = ₹ 3 Crores × 116.42/100 = ₹ 3,49,26,000
Total Settlement amount = 17,500 + 9,59,200 + 3,49,26,000 = ₹ 35902700 = Money received by RBI from PNB.

Cost of 3-day repo to PNB
Repo Interest = ₹ 17,500
3 day interest on G Sec = 9,59,200 – 9,29,225 = ₹ 29,975
Total = 47,475.

2(b)(i). Distinguish between 'Inter Corporate Deposits' and 'Public Deposits'. [3]

Answer to 2(b)(i):

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

2(b)(ii). Given are the details of dividend & capital gains distribution for a mutual fund with beginning and evening NAV for years 2010-2015. Calculate the five year compounded annual return. [5]

[Amount in ₹]

Particulars	2015	2014	2013	2012	2011	2010
Beginning NAV						**-10**
Dividends	**0.95**	**0.85**	**0.85**	**0.75**	**0.60**	
Capital Gains	**1.05**	**1.00**	**0.00**	**1.00**	**0.00**	
Closing NAV	**15.73**					

Answer to 2(b)(ii):

Particulars	2015	2014	2013	2012	2011	2010
Beginning NAV						-10
Dividends	0.95	0.85	0.85	0.75	0.60	
Capital Gains	1.05	1.00	0.00	1.00	0.00	
Closing NAV	15.73					
Net Cash Flow	17.73	1.85	0.85	1.75	0.60	-10

It can be seen that ₹ 10 is invested today and we get the following inflows i.e. Re. 0.60, ₹ 1.75, Re. 0.85 & ₹ 1.85 and finally ₹ 17.73 at the end of the fifth year. Therefore to find the 5 year compounded rate of return we need to simply find the IRR using the formula:
$-10+0.60/1+r + 1.75/(1+r)^2 + 0.85/(1+r)^3 + 1.85/(1+r)^4 + 17.73/(1+r)^5 = 0$
Solving for r, i.e. using interpolation we get, r = 20.63%.

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

Answer to 2(c)(i):

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(c)(ii). The RBI offers 91 -day T-Bill to raise ₹15000 Crores. The following bids have been received.

Bidder	Bid rate	Amount (₹ Crores)
A	**98.95**	**18,000**
B	**98.93**	**7,000**
C	**98.92**	**10,000**

(1) What is the yield for each of the price at which the bid has been made?

(2) 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? [3+2]

Answer to 2(c)(ii):

(1) $\text{Yield} = Y = \left(\frac{F-P}{P}\right) \times \frac{365}{M} \times 100$ where, M = 91 days for all.

$$A = \left(\frac{100-98.95}{98.95}\right) \times \left(\frac{365}{91}\right) \times 100 = 4.26\%$$

$$B = \left(\frac{100-98.93}{98.93}\right) \times \left(\frac{365}{91}\right) \times 100 = 4.34\%$$

$$C = \left(\frac{100-98.92}{98.92}\right) \times \left(\frac{365}{91}\right) \times 100 = 4.38\%$$

(2) As this is a yield based auction, and since the entire amount of ₹ 5,000 Crores can be sourced at the lowest yield of ₹ 4.26% itself, only A's bid would be accepted for ₹ 15,000 Crores.

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

Answer to 2(d)(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.

2(d)(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(d)(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%

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

3(a)(i). Describe the principle weaknesses of Indian Stock Market. [3]

Answer to 3(a)(i):

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.

Insider trading: obtaining market sensitive information to make money in the markets.

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

Answer to 3(a)(ii):

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 (a)(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

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

$$= \in 12 + \frac{65}{e^{0.08\times 0.25}} - \in 70$$

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

$$= \in 12 + 63.71 - \in 70 = \in 5.71$$

3(b)(i). Shares of Pranav Ltd are being quoted at ₹ 500. 3-Months Futures Contract Rate is ₹ 520 per share for a lot size of 500 shares.

If Pranav Ltd is not expected to distribute any Dividend in the interim, what is the recommended course of action for a trader in shares (Risk Free Rate being 9%)?

If the 3-Months Futures Contract Rate is ₹ 500, what should be the action? [3+3]

Answer to 3(b)(i):

1. Computation of Theoretical Forward Rate [TFP]

Particulars	Value
Spot Price [S_x]	₹ 500
Risk Free Interest Rate [r]	9% or 0.09
Period [t]	3 Months or 3/12 Yrs i.e. 0.25
Theoretical Forward Rate [TFP_x] $= S_x \times e^{rt}$ = ₹ 500 × $e^{0.09 \times 0.25}$ = ₹ 500 × $e^{0.0225}$ = ₹ 500 × 1.02276	**₹ 511.38**

2. Evaluation and Suggested Course of Action

Particulars	Case A	Case B
3-Months Futures Contract Rate [AFP_x]	₹ 520	₹ 500
TFPx Vs. AFPx	AFP_x is **Higher**	AFP_x is **Lower**
Valuation in Futures Market	Overvalued	Undervalued
Action	Buy Spot. Sell Future.	Sell Spot. Buy Future.

3(b)(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

Calculate the rate that bank should quote, to keep a margin of 0.5%. [6]

Answer to 3(b)(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 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 (c). 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(c):

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.

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

4(a)(i). List the techniques used in Industry Analysis? [2]

Answer to 4(a)(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.

4(a)(ii). 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 4(a)(ii):

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 $= D_1 \div (K_e - g) = D_0 X\ (1+ g)\ \div (K_e - g)$

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

The Intrinsic Value of share A is ₹ 11.67.

4(a)(iii). 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]

Answer to 4(a)(iii):

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.

4(b)(i). Mention any four important factors that you would consider for investment decisions in portfolio management. [2]

Answer to 4(b)(i):

Factors are:

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

4(b)(ii). The Capital of J Ltd, an exclusive software support service provider to B Ltd, is made up of 40% Equity Share Capital, 60% Accumulated Profits and Reserves. J does not have any other clients. The sensex yields a return of 15%. The risk-less return is measured at 6.75%.

(1) If the shares of J Ltd carry a Beta (β_J) of 1.6, compute cost of capital, and also the beta of activity support service to B Ltd.

(2) If there is another client, K Ltd, accounting for 35% of Assets of J Ltd, with a Beta of 1.40, what should be the Beta of B Ltd, so that the equity beta of 1.60 is not affected? In such a case, what should be expected return from B Ltd and K Ltd? [(2+2)+(1+1)]

Answer to 4 (b)(ii):

(1) Computation of Cost of Project & Beta of Project (Software Services to B Ltd)

Description of Factor	Measure
• Capital Structure of J Ltd	All Equity
• Nature of Capital Structure of J	Unlevered
• Beta of Equity of J Ltd [uβ]	1.60
• Project Status (Multiple or Single)	Single
• Project Beta (Beta of service to B = β_B)	To be ascertained
• Rule for Unlevered Firm with Single Project	$\beta u = \beta_J$
• Therefore, Beta of Software Services to B Ltd	1.60

Cost of Capital

Cost of Equity (K_E) = Return expected on Shares of J Ltd (i.e. $E(R_J)$]

K_E = Expected Return on J under CAPM
= $R_F + \beta_J$ X $(R_M - R_F)]$
= 6.75% + [1.60 x (15% - 6.75%)]
= 6.75% + [1.60 x 8.25%] = 6.75% + 13.20% = 19.95%

Beta of Services to B Ltd (Multiple Project Model)

Beta of J Shares Ltd (β_J) under Multiple Project scenario = Weighted Average of Betas of Projects

β_J = W_B X β_B + W_K X β_K
1.60 = [(1- 35%) x β_B] + [35% x 1.40]
1.60 = 0.65 x β_B + 0.49
0.65 β_B =1.60 - 0.49
β_B =1.11 ÷ 0.65 =1.708
Beta of B Ltd (β_B) should be 1.708

(2) Expected Return on Project B and Project K (Under CAPM Method)

Expected Return on Project B [$E(R_B)$]

= $R_F + [\beta_B$ X $(R_M - R_F)]$

= 6.75% + [1.708 x (15% - 6.75%)] = 6.75% + [1.708 x 8.25%]

= 6.75% + 14.091% = **20.841%**

Expected Return on Project K [$E(R_K)$]

= $R_F + [\beta_K$ x $(R_M – R_F)]$

= 6.75% + [1.40 x (15% - 6.75%)] = 6.75% + [1.40 x 8.25%]

= 6.75% + 11.55% = 18.30%

4 (c). Stocks P and Q have the following historical returns —

Year	2011	2012	2013	2014	2015
Stock P's Return (K)	-12.24	23.68	34.44	5.82	28.30
Stock Q's Return (K)	-7.00	25.55	44.09	2.20	20.16

You are required to calculate the average rate of return for each stock during the period 2011 to 2015. Assume that someone held a Portfolio consisting 50% of Stock P and 50% of Stock Q.

What would have been the realized rate of return on the Portfolio in each year from 2011 to 2015? What would been the average return on the Portfolio during the period? (You may assume that year ended on 31st March). [3+5]

Answer to 4(c):

1. **Calculation of average rate of return on Portfolio during 2011-2015**

Year	Stock P's Return %	Stock Q's Return %
2011	-12.24	-7.00
2012	23.68	25.55
2013	34.44	44.09
2014	5.82	2.20
2015	28.30	20.16
Total	80.00	85.00
Average rate of return	80/5 years = 16%	85/5 years =17%

2. Calculation of realized rate of return on Portfolio during 2011-2015

	Stock P			Stock Q			Total
Year	Proportion	Return	Net Return	Proportion	Return	Net Return	Net Return
1	2	3	4 = 3 x 2	5	6	7 = 5 x 6	8 = 4 + 7
2011	0.50	-12.24	-6.12	0.50	-7.00	-3.50	-9.62
2012	0.50	23.68	11.84	0.50	25.55	12.78	24.62
2013	0.50	34.44	17.22	0.50	44.09	22.05	39.27
2014	0.50	5.82	2.91	0.50	2.20	1.10	4.01
2015	0.50	28.30	14.15	0.50	20.16	10.08	24.23
			40.00			**42.51**	**82.51**

Average rate of return = ₹82.51 ÷ 5 = 16.50%

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

5 (a) (i) State forfaiting. List the features of forfaiting. [1+5]

Answer to 5(a)(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 (a)(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(a)(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 (b). 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 (b):

(1) 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**

(2) 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.

5 (c). 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 (c):

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.