Paper-14: ADVANCED FINANCIAL MANAGEMENT

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

The figures in the margin on the right side indicate full marks.
Answer Question No. 1 which is compulsory.
From Section A: Answer any two questions.
From Section B: Answer any one question.
From Section C: Answer any one question.
From Section D: Answer any one question.

Working Notes should form part of the answer.
"Whenever necessary, suitable assumptions should be made and indicated in answer by the candidates."

1. (a) Define 'owned fund' and 'net owned fund' in relation to non-banking financial company? [2]

(b) Mr. Smith inherited the following securities

Type of security	Nos.	Annual Coupon%	Maturity Years	Yield
Bond A (₹1,000)	10	9	3	12
Bond B(₹ 1000)	10	10	5	12
Pref. Shares C(₹ 100)	100	11	-	13
Pref Shares D (₹100)	100	12	-	13

Likelihood of being called a premium over year
Required:
Compute the current value of portfolios of Smith's uncle
[Given PVIFA (12% 3 years) = 2402, PVIFA (12%. 5 YEARS) = 3,605] [4]

(c) What do you understand by 'hybrid debt security'? Give Examples. [5]

(d) A company operating in JAPAN has today affected sales to an Indian company, the payment being due 3 months from the date of invoice. The invoice amount is 108 lakhs yen (¥). At today's spot rate, it is equivalent to ₹30 lakhs. It is anticipated that the exchange rate will decline by 10% over the 3 months period and in order to protect the yen (¥) payments, the importer proposes to take appropriate action in the foreign exchange market. The 3 months forward rate is presently quoted as 3.3. yen rupee. You are required to calculate the expected loss and to show how it can be hedged by a forward contract. [5]

(e) The NAV of each unit of a closed-end fund at the beginning of the year was ₹ 18. By the end of the year its NAV equals ₹ 18.50. At the beginning of the year each unit was selling at a 2% Premium to NAV and by the end of the year each unit is selling at a 4% discount to NAV.

If the closed-end fund paid year end distribution of income of ₹ 2-50 on each unit, find the rate of return to the investor in the fund during the year. [2]

(f) Shine Ltd. has a Beta of 1.15. Return on market portfolio is 14%. Return on Shine is 15.85%. Risk free rate is 5%.
What is the value of Alpha for Shine Ltd.? [2]

Answer: 1

(a) 'Owned Fund' and 'Net Owned Fund' in relation to NBFCs

'Owned Fund' means aggregate of the paid-up equity capital , preference shares which are compulsorily convertible into equity, free reserves , balance in share premium account and capital reserves representing surplus arising out of sale proceeds of asset, excluding reserves created by revaluation of asset, after deducting therefrom accumulated balance of loss, deferred revenue expenditure and other intangible assets.

'Net Owned Fund' is the amount as arrived at above, minus the amount of investments of such company in shares of its subsidiaries, companies in the same group and all other NBFCs and the book value of debentures, bonds, outstanding loans and advances including hire purchase and lease finance made to and deposits with subsidiaries and companies in the same group, to the extent it exceeds 10% of the owned fund.

(b) Computation of Current Value of Smith's Portfolio Inherited from Uncle

BONDA: (1000X10=10000)		
Interest p.a. (10000x0.09) ₹ 900 Compounded @ 12% for 3 years 900x 2.402 Current value of Bond Amount received on maturity @ 12% on 3rd year	2162 7120	9282
(10000x0.712)		
Bond B [1000 x 10=₹10000] Interest p.a. (10,000 x 0.10) = ₹ 1000 Compounded @ 12% for 5 yrs (1,000 x 3.605) Current value of Bond Amount received on maturity @ 12% on 5 years (10,000 x 0.567)	 3605 5670	9275
Preference Shares C: (₹100 x 100 Nos x 0.11)0.13 =1100/0.13		8462
Preference shares D: (₹ 100 x 100 Nos x 0.12) 0.13 =1200/0.13)		9231
Total		36250

(c) Hybrid securities are a broad group of securities that combine the elements of the two broader groups of securities, debt and equity. Hybrid securities pay a predictable (fixed or floating) rate of return or dividend until a certain date, at which point the holder has a number of options including converting the securities into the underlying share.

A hybrid debt security is a debt security combined with a derivative such as forward, swap, or option. Historically, the most common form of hybrid security has been the convertible bond.

Hybrids are essentially devices for managing risk. Examples of different types of hybrids are given below:

Hybrids to manage commodity risk— This hybrids includes a zero coupon bond and a call option. This type of hybrid issued in 1986.

Hybrids to manage foreign exchange risk— This is the dual currency bond which includes principle amount in one currency and interest in other country currency.

Hybrids to manage interest rate risk—This hybrid is divides into two parts. They are:

(1) A Floating rate bullet repayment note and

(2) A plain interest swap for double the principle.

(d) Sales effected today to an Indian Company = 108 lakhs Yen (¥)

Sales effected in Indian Currency = ₹ 30 lakhs

Spot rate would be 108/30 = 3.6 ¥

Decline in the spot rate is 10% over the 3 months period

The exchange rate would be = 3.6 - (3.6 x 0.10) = 3.24 ¥

Amount to be paid after 3 month would be ₹ 30 lakhs x 3.24 = 97.2 lakhs Yen

∴The expected loss would be 108 lakhs — 97.2 lakhs = 10.8 lakhs Yen

If he takes the forward contract, then the exchange rate would be 3.3 yen per rupee.

The amount receivable after 3 months if he takes the forward contract = 3.3 x 30 = 99 lakhs yen

∴ The loss reduced to 9 lakhs yen if he takes the forward contract.

(e) The price of unit at the beginning of the year

18 × 1.02 = ₹ 18.36

The price of unit at the end of the year

18.50 × (1 – 0.04) = ₹ 17.76

The price of the fund fell by (17.76 – 18.36) = - 0.60

Rate of return = (2.50 – 0.60) ÷ 18.36 = 10.35%

(f) Actual return – CAPM Return

$\alpha = Rp – [Rf + (Rm – Rf)\ \beta]$

$= 15.85 – \{5+1.15(14-5)\} = 0.50\%$

SECTION A

(Answer any two of the following.)

Question 2.

(a) Write down the other risks to which the derivatives clearing houses may be exposed.

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

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

(ii) Instead, if the upper limit to buying price is ₹ 3,200 what strategy can the firm adopt?

(iii) If the firm decides to hedge through futures, find out the effective price it would pay for crude oil if at the time of lifting the hedge (a) the spot and futures price are ₹ 2,900 and ₹ 2,910 respectively, (b) the spot and futures price are ₹ 3,300 and ₹ 3,315 respectively. [4+(2+2+4)]

Answer: 2 (a)

Other Risks to which the Derivatives Clearing Houses may be exposed:

(i) Market Risk: A clearing house may be subject to market risk if it accepts securities as margin. Clearing houses usually address this market risk by discounting the value of non-domestic currencies and securities posted as margin (i.e. by subjecting them to "haircuts") and by marking them to market daily.

(ii) Currency Exchange Risk: If the clearing house accepts non-domestic currency as margin or if it clears contracts that are denominated and settled in a non-domestic currency, but that are collateralized with domestic currency or assets denominated in domestic currency. Clearing houses usually address this risk by subjecting non-domestic currency and assets denominated in non-domestic currency to haircuts and by marking all

(iii) Operational risk: Any operational problem that delays settlement or prevents the clearing house from resolving a default could increase counterparty exposures. In addition, an operational breakdown might prevent a clearing house from monitoring its exposures.

(iv) Legal risks: The enforceability of netting arrangements, the ability to realize a defaulting member's assets, the finality of payments and securities transfers, the enforceability of the clearing house's internal rules and the general legal framework applicable in the jurisdiction in which the clearing house operates must be subject to a high degree of legal certainty.

Answer: 2. (b)

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

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

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

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

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

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

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

3. (a) Explain the typical attributes of hard infrastructure.

(b) What are the differences between Merchant Banks and Commercial Banks? [8+4]

Answer: 3. (a)

Hard infrastructure generally has the following attributes:

(i) Capital assets that provide services

These are physical assets that provide services. The people employed in the hard infrastructure sector generally maintain, monitor, and operate the assets, but do not offer services to the clients or users of the infrastructure. Interactions between workers and clients are generally limited to administrative tasks concerning ordering, scheduling, or billing of services.

(ii) Large networks

These are large networks constructed over generations, and are not often replaced as a whole system. The network provides services to a geographically defined area, and has a long life because its service capacity is maintained by continual refurbishment or replacement of components as they wear out.

(iii) Historicity and interdependence

The system or network tends to evolve over time as it is continuously modified, improved, enlarged, and as various components are rebuilt, decommissioned or adapted to other uses. The system components are interdependent and not usually capable of subdivision or separate disposal, and consequently are not readily disposable within the commercial marketplace. The system interdependency may limit a component life to a lesser period than the expected life of the component itself.

(iv) Natural monopoly

The systems tend to be natural monopolies, insofar that economies of scale means that multiple agencies providing a service are less efficient than would be the case if a single agency provided the service. This is because the assets have a high initial cost and a value that is difficult to determine. Once most of the system is built, the marginal cost of servicing additional clients or users tends to be relatively inexpensive, and may be negligible if there is no need to increase the peak capacity or the geographical extent of the network.

In public economics theory, infrastructure assets such as highways and railways tend to be public goods, in that they carry a high degree of non-excludability, where no household can be excluded from using it, and non-rivalry, where no household can reduce another from enjoying it. These properties lead to externality, free ridership, and spill over effects that distort perfect competition and market efficiency. Hence, government becomes the best actor to supply the public goods.

Answer: 3. (b)

The differences between merchant banks and commercial banks are;-

(i) Commercial banks do banking business i.e. accept deposits and use deposits for giving loan but merchant bank works as consultancy type business i.e. helps in issue of management, issue of shares etc.

(ii) The nature of loan given by commercial bank is debt related but loan given by merchant bank is equity related.

(iii) Commercial bank does not take any risk of client but merchant bank takes risk of client.

(iv) Commercial bank acts as a financer but merchant bank acts as a financial advisor.

(v) Commercial Banks are regulated by the Banking Regulation Act, 1949 and is under the control of RBI whereas merchant bankers are governed by rules and regulations framed by SEBI.

(vi) Commercial banks do mass banking with general public but merchant bank deals with a class of selected clients.

Question 4.

Ganesh Ltd has promoted an open-ended equity oriented scheme in 2004 with two plans — Dividend Reinvestment Plan (Plan A) and Bonus Plan (Plan B); the face value of the units was ₹10 each. P and Q invested ₹5 Lakhs each on 01.04.2006 respectively in Plan A and Plan B, when the NAV was ₹42.18 for Plan A and P ₹35.02 for Plan B. P and Q both redeemed their units on 31.03.2013. Particulars of dividend and bonus declared on the units over the period were as follows —

Date	Dividend	Bonus Ratio	NAV for Plan A	NAV for Plan B
15.09.2006	15	—	46.45	29.10
28.07.2007	_	1 : 6	42.18	30.05
31.03.2008	20	—	48.10	34.95
31.10.2008	—	1 : 8	49.60	36.00
15.03.2009	18	—	52.05	37.00
24.03.2010	—	1:11	53.05	38.10
27.03.2011	16	—	54.10	38.40
28.02.2012	12	1:12	55.20	39.10
31.03.2013	—	—	50.10	34.10

You are required to calculate the annual return for P and Q after taking into consideration the following information —

(a) Securities Transaction Tax at 2% on redemption

(b) Liability of Capital Gains to Income Tax —

(i) Long Term Capital Gains — Exempt

(ii) Short Term Capital Gains —10% Plus Education Cess at 3%. **[6+6]**

Answer: 4.

Note: Under Dividend Reinvestment Plan, dividend will be declared as percentage of the face value of units outstanding, and units will be allotted for the amount of dividend based on the NAV on the date of dividend declaration.

1. Plan A for Mr. P

(a) Units Purchased

Particulars	Value
Amount Invested	₹5,00,000
NAV per Unit on 01.04.2006	₹42.18
No. of Units Purchased [₹5,00,000 ÷ ₹42.18]	11,853.96

(b) Units Allotted under Dividend Reinvestment

Date of Dividend	Units Outstanding	Dividend Rate	Dividend Amount	NAV on that date	Additional Units Allotted	Total Units
1	2	3	4 = 2 × ₹10 × 3	5	6 = 4 × 5	7
15.09.2006	11,853.96	15%	₹ 17,780.94 [11,853.96 × ₹10 x 0.15]	₹46.45	382.79 [17780.94 ÷ 46.45]	12,236.75
31.03.2008	12,236.75	20%	₹24,473.50 [12,236.75 × ₹10 × 0.20]	₹48.10	508.80 [24473.50 ÷ 48.10]	12,745.55
15.03.2009	12,745.55	18%	₹22,941.99 [12,745.55 × ₹10 × 0.18]	₹52.05	440.77 [22941.99 ÷ 52.05]	13,186.32
27.03.2011	13,186.32	16%	₹21,098.11 [13,186.32 × ₹10 × 0.16]	₹54.10	389.98 [21098.11 ÷ 54.10]	13,576.30
28.02.2012	13,576.30	12%	₹16,291.56 [13,576.30 × ₹10 × 0.12]	₹55.20	295.14 [13576.3 ÷ 55.20]	13,871.44

(c) Redemption Proceeds and Annual Return

Particulars		Value
Units Redeemed		13,871.44
NAV per Unit on 31.03.2013 (date of redemption)		₹50.10
	Gross Redemption Proceeds [13,871.44 Units X ₹50.10]	₹6,94,959.14
Less:	Securities Transaction Tax @ 2%	₹13,899.18
	Net Proceeds	₹6,81,059.96
Less:	Initial Investment	₹5,00,000.00
Total Return for 7 Years		₹1,81,059.96
Annual Return $= \frac{\text{Total Return}}{\text{Initial Investment}} \times \frac{1}{\text{Period of Investment}}$ $= \frac{1,81,059.96}{5,00,000} \times \frac{1}{7 \text{ Years}} = 5.17\%$		5.17%

Note: Since all the units redeemed are held for more than 12 months, all the units are long term capital assets under the income tax, and therefore, gain on their redemption is exempt from income tax.

2. Plan B for Mr. Q

(a) Units Purchased

Particulars	Value
Amount Invested	₹5,00,000
NAV per Unit on 01.04.2006	35.02
No. of Units Purchased [₹5,00,000 ÷ ₹35.02]	14,277.56

(b) Units Allotted under Bonus

Date	Description	Units
01.04.2006	Purchase of Units for ₹5,00,000 at ₹35.02 per Unit	14,277.56
28.07.2007	Add: Bonus Issue at 1 : 6 = 1/6 × 14,277.56	2,379.59
	Total Units after First Bonus Issue	16,657.15
31.10.2008	Add: Bonus Issue at 1 : 8 = 1/8 × 16,657.15	2,082.14
	Total Units after Second Bonus Issue	18,739.29
24.03.2010	Add: Bonus Issue at 1 : 11 = 1/11 × 18,739.29	1,703.57
	Total Units after Third Bonus Issue	20,442.86
28.02.2012	Add: Bonus Issue at 1 : 12 = 1/12 × 20,442.86	1,703.57
31.03.2012	**Total Units after Fourth Bonus Issue = Units Outstanding on the date of redemption i.e. 31.03.2013**	**22,146.43**

(c) Redemption Proceeds and Annual Return

Particulars		Value
Units Redeemed		22,146.43
NAV per Unit on 31.03.2013 (date of redemption)		₹34.10
	Gross Redemption Proceeds [22,146.43 Units × ₹34.10]	₹7,55,193.26
Less:	Securities Transaction Tax @ 2%	₹15,103.87
	Net Proceeds	₹7,40,089.39
Less:	Initial Investment	₹5,00,000.00
Total Return for 7 Years		₹2,40,089.39
Annual Return $= \frac{\text{Total Return}}{\text{Initial Investment}} \times \frac{1}{\text{Period of Investment}}$ $= \frac{2,40,089.39}{5,00,000} \times \frac{1}{7\ \text{Years}} = 6.86\%$		6.86%

Note: Since all the units (financial assets) redeemed are held for more than 12 months, all the capital assets under the income tax law, and therefore, gain on their redemption is exempt from units are long term income tax.

SECTION B
(Answer any one of the following.)

Question 5.

(a) Explain the major sources for raising foreign currency finances?

(b) Your Company has to make a US $ 1 Million payment in three month's time. The dollars are available now. You decide to invest them for three months and you are given the following information.

- **The US deposit rate is 8% p.a.**
- **The sterling deposit rate is 10% p.a.**
- **The spot exchange rate is $ 1.80 / pound.**
- **The three month forward rate is $ 1.78/ pound.**

(i) Where should your company invest for better results?

(ii) Assuming that the interest rates and the spot exchange rate remain as above, what forward rate would yield an equilibrium situation?

(iii) Assuming that the US interest rate and the spot and forward rates remain as in the original question, where would you invest if the sterling deposit rate were 14% per annum?

(iv) With the originally stated spot and forward rates and the same dollar deposit rate, what is the equilibrium sterling deposit rate?

(c) Ramesh has ₹60 Lakhs in hand. He is contemplating investment in the shares of Vignette Accessories Ltd (VAL) which is being traded at ₹ 200 per share.

Ramesh expects a dividend declaration of ₹37 per share 3 months hence and a market price of ₹185 per share at the end of the year, at which Ramesh plans to sell of all his holdings.

If the discount rate is 12% p.a., what will be the course of action if Ramesh discounts his cash flows under continuous compounding approach and monthly discounting approach? [6+(3+1+2+2)+6]

Answer: 5. (a)

Major sources for raising foreign currency finances are as follows:

(i) Foreign Currency Term Loan: Financial Institutions provide Foreign Currency Term Loan for meeting the foreign currency expenditures towards —

a. Import of Plant, Machinery and Equipment, and

b. Payment of Foreign Technical Know How Fees.

(ii) Export Credit Schemes: Export Credit Agencies finance exports of capital goods and related technical services.

Types of Export Credit:

- **Buyer's Credit**: Credit is provided directly to the Indian buyer, for purchase of capital goods and / or technical service from the overseas exporter.
- **Supplier's Credit**: Credit is provided to the overseas exporters, so that they can make available medium-term finance to Indian importers.

Regulatory: These agencies are formed by the Governments of the respective countries and follow certain consensus guidelines for supporting exports, under a convention known as the Berne Union.

(iii) External Commercial Borrowings (ECB): These include raising finance from international markets for plant and machinery imports. Funds can be raised subject to the terms and conditions stipulated by the Government of India, which imposes restrictions on the amount raised under automatic route. Funds raised above the stipulated limit would require the prior approval of the Ministry of Finance.

Types of ECB: External Commercial Borrowings include Bank Loans, Supplier's and Buyer's credit, fixed and floating rate bonds and Borrowing from private sector windows of Multilateral Financial Institutions such as International Finance Corporation.

(iv) Euro Issues: Subscription can come from any part of the world except India. This takes the following forms —

a. **Depository Receipts Mechanism:** An indirect equity investment, these are issued through Overseas Depository Banks, on behalf of the issuing Company.
b. **Foreign Currency/ Euro Convertible Issues:** Euro Convertible Issues is a debt with 'an option to convert it into equity.
c. **Debt Route:** Funds can also be raised by way of pure Debt Bonds.

(v) Issues in Foreign Domestic Markets: Capital can also be raised by issuing Exchange Traded instruments in Foreign Markets. These include ADRs, GDRs, etc.

Answer: 5. (b)

(i) Invest for better results

Since the US $ are available now, amount can be invested in

a. US $ Deposits @ 8% p.a. or
b. Converted into Sterling Currency at the Spot Rate and invested in UK Deposits.

Alternative 1

Particulars	Value
Invest in $ deposits @ 8% p.a. for 3 months.	
Income = $ 10,00,000 x 8/100x3/12	$ 20,000

Alternative 2

	Particulars	Value
1.	Convert Dollars into Pounds at Spot Rate (US $ 10,00,000 ÷ 1.80)	£5,55,556
2.	Invest £5,55,556 in Sterling Deposits at the rate of 10% p.a. for 3 months interest on £5,55,556 @ 10% for 3 months = £5,55,556 10% × 3/12	£13,889
3.	Total Cash Inflow at the end of 3 months [(2)+(3)]	£5,69,445
4.	Amount earned in US $ = [(4) × 1.78 (Forward Rate)]	US $ 10,13,612
5.	Gain in US $ [10,13,612 – 10,00,000]	US $13,612

Gain in **Alternative 1** is higher. Hence, company should invest in US Deposits.

(ii) Equilibrium Forward Rate 3 Months Forward; (for 1 £)

= Spot Rate X [(1 + US Interest Rate for 3 Months) / (1 + Sterling Interest Rate for 3 Months]

= $ 1.8 X [(1 + 8%/4) / (1 + 10%/4)] = **$1.7912/ £ [Interest Rate Parity Method]**

Equilibrium 3 months Forward Rate = $ 1.7912 / £

(iii) Investment if Sterling Deposit: Rate is 14%

Particulars	Amount
1. Amount invested in Sterling Deposit Rate	£ 5,55,556
2. Interest Income @ 14% for 3 months £ 5,55.556 x 14 % x 3 / 12	£ 19,444
3. Total Cash Inflow at the end of 3 months [(2)+ (3)]	£ 5,75,000
4. Amount earned in US $ = [(4) x 1.78 (Forward Rate)]	US $ 10,23,500
5. Gain in US $ [10,23,500 - 10,00,000]	US $ 23,500

Conclusion: Gain is highest of all the considered alternatives, therefore amount should be invested in Sterling Deposits @ 14%.

(iv) Equilibrium Sterling Deposit Rate Franc Interest Rate [6 Months] = Assuming Sterling Interest Rate = x, applying the same in Interest Rate Parity Formula for determining Forward Rate —

$$£1 = \text{Spot Rate} \times \frac{(+ \text{US Rate for 3 Months})}{(+ \text{Sterling Rate for 3 Months})}$$

1 £ = $1.80 X (1 + 8%/4) / (1 + x/4)

1 £ = $1.80 x (1 + 0.02) / (1 + x/4);

⇒ $1.78 = $1.80 x (1 + 0.02)/ (1 + x/4):

⇒ 1+ x/4 = $ 1.80 X 1.02/$ 1.78

⇒ x/4 = 1.03146 -1 = 0.03146 or 3.146%

⇒ **x = 12.58%**

Equilibrium Sterling Interest Rate = 12.58%

Answer: 5. (c)

Time	Nature of Cash Flow	Cash Flow	Continuous Compounding		Monthly Discounting	
			PV Factor at 12%	Discounted Cash Flow	PV Factor at 12%	Discounted Cash Flow
(1)	(2)	(3)	(4) = $[1 \div e^{0.12 \times (n)/12}]$	(5) = (3) x (4)	(6)=$[1 \div (1+12\%/12)]^{(n)}$	(7) = (3) x (6)
0	Investment (Outflow)	(60,00,000)	1 $[1 \div e^{0.12 \times 0/12}]$	(60,00,000)	1	(60,00,000)
3	Dividend Inflow)	11,10,000	0.9704 $[1 \div e^{0.12 \times 3/12}]$	10,77,144	0.9706 $[1 \div 1.01]^{3}$	10,77,366
12	Sale (Inflow)	55,50,000	0.8869 $[1 \div e^{0.12 \times 12/12}]$	49,22,295	0.8874 $[1 \div 1.01]^{12}$	49,25,070
	Net Present Value			**(561)**		**2,436**

Conclusion: If Ramesh follows monthly discounting option, he will buy the shares of Vignette Accessories Ltd.

Note: No. of share 60,00,000/200 = 30,000 Shares.

Question 6.

(a) Unitech DLS's, international transfer of funds amounts to US $20 Lakhs monthly. Presently the average transfer time is 10 days. It has been proposed that the transfer of funds be turned over to one of the larger international banks, which can reduce the transfer time to an average of two days. A charge of 0.5% of the volume of transfer has been proposed for this service. In view of the fact that the firm's opportunity cost of funds is 12%, should this offer be accepted?

(b) Illustrate types of Liquidity risk.

(c) You as a dealer in foreign exchange have the following position in Swiss Francs on 31.10.2013-

Particulars	SFr.	Particulars	SFr.
Balance in the Nostro A/c Credit	1,00,000	Forward purchase contract cancelled	30,000
Opening Position Over bought	50,000		
Purchased a bill on Zurich	80,000	Remitted by TT	75,000
Sold forward TT	60,000	Draft on Zurich cancelled	30,000

What steps would Mr. Sen take, if he required maintaining a credit balance of S Fr. 30,000 in the Nostro A/c and keeping as over bought position on SFr. 10,000?

(d) State the benefits of using Financial Derivatives? [5+5+6+4]

Answer: 6. (a)

Effective Yield on Saving

Period Saved = 10 Days **Less** 2 Days	8 Days
Cost of Funds	12%p.a.
Percentage Yield for the period saved (8/365 x 12%p.a.)	0.263%

Evaluation

(i) The cost of international transfer of 0.5% is more than the amount of interest saved at 0.263% i.e. more by around 0.237%. Therefore, prima facie the Company should not opt for the proposal of transferring through International Bank.

(ii) However, saving in time also reduces the exposure of funds to various foreign exchange risks. The Company has to consider the effect of such exposure and decide on the proposal of the International Bank. If expected cost of such exposure is more than 0.237%, then the Company should go for transfer through International Banks.

Answer: 6. (b)

Types of Liquidity Risk

Market liquidity - An asset cannot be sold due to lack of liquidity in the market – essentially a sub-set of market risk. This can be accounted for by:

- Widening bid/offer spread
- Making explicit liquidity reserves
- Lengthening holding period for VaR calculations

Funding liquidity - Risk that liabilities:

- Cannot be met when they fall due
- Can only be met at an uneconomic price
- Can be name-specific or systemic

Example:

Liquidity risk immediate generally arises when a business or individual with cashholds ,needs a valuable asset that it cannot trade or sell at market value,due to a lack of buyers or due to an inefficient where it is difficult to bring buyers and sellers together.

For example, consider a $1,000,000 home with no buyers. The home obviously has value, but due to market conditions at the time, there may be no interested buyers. In better economic times when market conditions improve and demand increases, the house may sell for well above that price. However, due to the home owner's need of cash to meet near term financial demands, the owner may be unable to wait and have no other choice but to sell the house in an illiquid market at a significant loss. Hence, the liquidity risk of holding this asset.

Answer: 6. (c)

Particulars	**Sw. Frcs**	**Particulars**	**Sw.Frcs**
To Balance b/d	50,000	By Sales of Forward TT	60,000
To Purchase of Bill on Zurich	80,000	By Forward Purchase Contract	
To Cancellation of Draft	30,000	Cancellation	30,000
To Buy Spot TT (Nostro)	5,000	By Remittance by TT (Nostro)	75,000
To Buy Forward (To maintain Balance)	10,000	By Balance c/ d (Given)	10,000
	1,75,000		**1,75,000**

Dr. **Nostro Account** **Cr.**

Particulars	Sw. Frcs	Particulars	Sw. Frcs
To Overbought Remittance	75,000	By Balance b/d	1,00,000
To Balance c/d	30,000	By Buy Spot TT (To maintain Balance)	5,000
	1,05,000		**1,05,000**

Courses of Action

The Bank has to buy spot TT Sw. Fcs. 5,000 to increase the balance in Nostro Account to Sw. Fcs. 30,000.

Since the bank requires an overbought position of Sw. Fes. 10,000, it has to buy forward Sw. Fcs. 10,000.

Answer: 6. (d)

(d) Benefits of Using Financial Derivatives

The general benefits of using financial derivatives as follows:

(i) A prudent use of financial derivatives can provide a new mechanism to manage or reduce various business risks at low transaction cost.

(ii) The innovative use of financial derivatives can greatly help end-users cut their financing cost.

(iii) Financial derivatives can provide more access to financial markets, especially to unfamiliar ones at lower costs. Put another way, they can create more complete markets to investors.

(iv) Financial derivative instruments play an important role in asset management due to their lower transaction costs relative to the spot market instruments.

(v) The users of financial derivatives can expect to be offered opportunities on taking advantage of asymmetries in tax and regulatory requirements across different countries, markets or securities.

(vi) Financial derivatives can be used to speculate and make profits by assuming certain risks, probably with suitable degree.

SECTION C

(Answer any one of the following.)

Question 7.

(a) Describe the term 'Portfolio rebalancing'.

(b) A group of analysis believes that the returns of the portfolios are governed by two vital factors—

1. the rate of economic growth and 2. the sensitivity of stock to the developments in the financial markets. The sensitivities of returns with respect to these two factors are denoted by β_1 and β_2 respectively.

Further these analysts believe that returns on three carefully crafted Portfolios X, Y and Z must be predominantly governed by these two factors alone leaving remaining to some company/ portfolio specific factors. Assume that these three Portfolios X, Y, and Z are found to have following beta co-efficients:

Portfolio	Expected Return, %	β_1	B_2
X	16.00	1.00	0.80
Y	25.00	1.50	1.30
Z	32.00	2.00	1.50

Find out the Arbitrage Pricing Theory (APT) equation governing the returns on the portfolios.

(c) Satendra has the following investments:

Stock	Expected return %	Portfolio weight %	Beta
PQR	15.00	40	0.6
QPR	25.40	30	1.4
RPQ	20.60	30	1.1

(i) What is the expected return and β of Satendra's portfolio?

(ii) Satendra has now decided to take on some additional risk in order to increase his expected return, by changing his portfolio weights. If Satendra's new portfolio's expected return is 22.12% and its β is 1.165, what are his new portfolio weights?

[4+6+(2+4)]

Answer: 7. (a)

Portfolio rebalancing is the action of bringing a portfolio of investments that has deviated away from one's target asset allocation back into line. Under-weighted securities can be purchased with newly saved money; alternatively, over-weighted securities can be sold to purchase under-weighted securities. The investments in a portfolio will perform according to the market. As time goes on, a portfolio's current asset allocation can move away from an investor's original target asset allocation. If left un-adjusted, the portfolio could either become too risky, or too conservative. The goal of rebalancing is to move the current asset allocation back in line to the originally planned asset allocation.

Determining an effective rebalancing strategy is a function of the portfolio's assets: their expected returns, their volatility, and the correlation of their returns. For example, a high correlation among the returns of a portfolio's assets means that they tend to move together, which will tend to reduce the need for rebalancing. In addition, the investment time horizon affects the rebalancing strategy. A portfolio with a short time horizon is less likely to need rebalancing because there is less time for the portfolio to drift from the target asset allocation. In addition, such a portfolio is less likely to recover the trading costs of rebalancing.

Answer: 7. (b)

Arbitrage Pricing Theory for two factors is

$R_p = \lambda_0 + \lambda_1\beta_1 + \lambda_2\beta_2$

Putting the given values in the APT to solve for three unknown variables:

For Portfolio X: $16 = \lambda_0 + \lambda_1 \times 1.00 + \lambda_2 \times 0.80$ (1)

For Portfolio Y: $25 = \lambda_0 + \lambda_1 \times 1.50 + \lambda_2 \times 1.30$ (2)

For Portfolio Z: $32 = \lambda_0 + \lambda_1 \times 2.00 + \lambda_2 \times 1.50$ (3)

Subtracting (1) from (2)

$9 = \lambda_1 \times 0.50 + \lambda_2 \times 0.50$ (4)

Subtracting (1) from (3)

$16 = \lambda_1 \times 1.00 + \lambda_2 \times 0.70$ (5)

Multiplying (4) with 2, we get

$18 = \lambda_1 \times 1.00 - \lambda_2 \times 1.00$ (6)

Subtracting (5) from (6), we get

$\lambda_2 = 20/3$

Putting the value in (4)

$9 = 10/3 + \lambda_1 \times 0.50$

gives $\lambda_1 = 34/3$

Putting the values of λ_1 and λ_2 in (3) we get

$32 = \lambda_0 + 2 \times 34/3 + 1.50 \times 20/3$

and $\lambda_0 = -2/3$

APT would then be $R_p = -2/3 + 34/3 \times \beta_1 + 20/3 \times \beta_2$

Answer: 7. (c)

(i) We can calculate the expected return of Satendra as follows:

$E(R) = (0.40)(0.15) + (0.0)(0.254) + (0.30)(0.206) = 0.198$ and

$\beta_P = (0.40)(0.60) + (0.30)(1.40) + (0.30)(1.10) = 0.990.$

(ii) Let X_1 be the new weight on PQR, X_2 be the new weight on QPR and $X_3 = 1 - X_1 - X_2$ be the new weight on RPQ. Then, we have:

$X_1 (0.15) + X_2 (0.254) + (1 - X_1 - X_2)(0.206) = 0.2212$

$X_1 (0.0.60) + X_2 (1.40) + (1 - X_1 - X_2)(10.10) = 1.1650$

Rearranging these two equations gives:

$X_1 (-0.056) + X_2 (0.048) = 0.0152$

$X_1 (-0.50) + X_2 (0.30) = 0.0650$

Solving we get $X_1 = 0.20$

$X_2 = 0.55$ and

$X_3 = 0.25$

Therefore the new weights are 20% on PQR, 55% on QPR and 25% on RPQ.

Question 8.

(a) An investor owns the following investments:

(i) 1 million equity shares of P Ltd. Price ₹ 40, Beta 1.10

(ii) 2 million equity shares of Q Ltd. Price ₹ 30, Beta 1.20

(iii) 3 million equity shares of R Ltd. Price ₹ 10, Beta 1.30

The investor wants to enhance the beta of his portfolio to 1.50. Suggest.

(b) Sumit Mills has expected dividend growth of 7% and the average market return is 12% per annum. Dividend expected end-year on Sumit is ₹ 2.50. The company stock has β = 2.00 and the risk free rate is 6%. What is the risk-adjusted rate of return on Sumit assuming the CAPM holds? What is the fair price of the equity share if the current market price is ₹ 20? What are the risks attached to the investment strategy?

(c) The rates of return on the security of Company P and market portfolio for 10 periods are given below:

Period	Return of Security P (%)	Return on Market Portfolio (%)
1	20	22
2	22	20
3	25	18
4	21	16

5	**18**	**20**
6	**-5**	**8**
7	**17**	**-6**
8	**19**	**5**
9	**-7**	**6**
10	**20**	**11**

(i) What is the beta of Security P?

(ii) What is the characteristic line for Security P? [5+3+(6+2)]

Answer: 8. (a)

To increase the Beta to 1.50, the investor should borrow some money (Assuming that the investor can borrow money at risk free rate of interest) and invest the same in the equity shares of the three companies (the new investment should be in the ratio of amounts of present investment).

To calculate the overall beta, the borrowing is taken as negative investment, its risk is considered as zero (there is no risk in borrowing, there is risk in investing the amount of borrowing in the shares of the three companies) and its beta is taken as zero.

Existing portfolio beta = [(1.10 x 40/130) + (1.20 x 60/130) + 1.30 x 30/130)] = 1.1923

% required increase in risk = [(1.50 – 1.1923)/1.1923] x 100 = 25.81%

Borrowings = 130 m x 0.2581 = 33.55m. This amount should be invested in the shares of the three companies (the new investment should be in the ratio of amounts of present investments)

Calculation of beta in the changed scenario:

Investment	Beta (X)	Amount of investment	Weight (W)	XW
P Ltd.	1.10	40 m + (33.55 x 4/13)m = 50.32m	50.32/130 = 0.3871	0.4258
Q Ltd.	1.20	60m + (33.55 x 6/13)m = 75.48m	75.48/130 = 0.5806	0.6967
R Ltd.	1.30	30m + (33.55 x 3/13)m = 37.75m	37.75/130 = 0.2904	0.3775
Borrowings	0	- 33.55 m	- 33.55/130	0
		130m		1.50

Answer: 8. (b)

Risk adjusted rate of return on Sumit, using CAPM is :

$ER_i = ER_f + \beta_i (ER_m - ER_f)$

$= 6\% + 2.00(12\% - 6\%) = 18\%$

Fair value of Sumit is:

$V = D/(ER_i - g)$

$= ₹ 2.50/ (0.18 - 0.07)$

$= ₹ 22.73$

Since the Sumit's equity is underpriced, the investor should buy the equity shares. But the CAPM measure ER_i may not hold for all future periods. If the market price diverges from the fair value, the demand for the Sumit will shot up till there is equilibrium.

Answer: 8. (c)

(i)

Period	**R_x**	**R_m**	$(R_x - \bar{R}_x)$	$(R_m - \bar{R}_m)$	$(R_x - \bar{R}_x)(R_m - \bar{R}_m)$	$(R_m - \bar{R}_m)^2$
1	20	22	5	10	50	100
2	22	20	7	8	56	64
3	25	18	10	6	60	36
4	21	16	6	4	24	16
5	18	20	3	8	24	64
6	-5	8	-20	-4	80	16
7	17	-6	2	-18	-36	324
8	19	5	4	-7	-28	49
9	-7	6	-22	-6	132	36
10	20	11	5	-1	-5	1
	150 = $\sum R_x$	120 = $\sum R_m$			357 = $\sum (R_x - \bar{R}_x)(R_m - \bar{R}_m)$	706 = $\sum (R_m - \bar{R}_m)^2$

$$\bar{R}_x = \frac{\sum R_x}{n} = \frac{150}{10} = 15$$

$$\bar{R}_m = \frac{\sum R_m}{n} = \frac{120}{10} = 12$$

$$\sigma_m^2 = \frac{\sum (R_m - \bar{R}_m)^2}{n-1} = \frac{706}{9} = 78.44$$

$$Cov_{xm} = \frac{\sum (R_x - \bar{R}_x)(R_m - \bar{R}_m)}{n-1} = \frac{357}{9} 39.67$$

$$\beta_x = \frac{Cov_{xm}}{\sigma_m^2} = \frac{39.67}{78.44} = 0.506$$

(ii) Y = 15, x = 12

$$Y = \alpha + \beta x$$

$$15 = \alpha + (0.506 \times 12)$$

$$\alpha = 15 - (0.506 \times 12) = 8.928\%$$

Characteristic Line for Security P = $\alpha + (\beta \times R_m)$

Where R_m = Expected return on market index

Then, Characteristic Line for Security $P = 8.928 + 0.506R_m$

SECTION D

(Answer any one of the following.)

Question 9.

(a) Clustfine company is considering the purchase of a new plastic extrusion machine at a cost of ₹ 2,00,000. The future cashflows, after tax, are dependent on the success of the company's marketing program and on the economic growth in the geographic area. The following probability tree outlines the possible cash flows and their probabilities of occurrence.

Branch	Initial Probability	Yr 1 Cash Flow(000s)	Conditional Probability*	Yr 2 Cash Flow (000s)
1	0.20	- ₹200	0.25	- ₹1,500
2	0.20	- ₹200	0.25	- ₹1,100
3	0.20	- ₹200	0.50	- ₹700
4	0.60	₹200	0.10	- ₹300

5	0.60	₹200	0.80	₹100
6	0.60	₹200	0.10	₹500
7	0.20	₹600	0.50	₹900
8	0.20	₹600	0.25	₹1,300
9	0.20	₹600	0.25	₹1,700

***Probability in period 2, probability in period 1 given.**

What are the joint probabilities of occurrence of the various branches?

If the risk-free rate is 8% what is

(i) the NPV of each of the 9 complete branches

(ii) the expected value and standard deviation of the probability distribution of possible net present values?

(b) A firm can make investment in either of the following two projects. The firm anticipates its cost of capital to be 10% and the net (after tax) cash follows of the projects for five years are as follows:

(Figures in ₹'000)

Year	0	1	2	3	4	5
Project – X	(500)	85	200	240	220	70
Project – Y	(500)	480	100	70	30	20

The discount factors are as under:

Year	0	1	2	3	4	5
PVF (10%)	1	0.91	0.83	0.75	0.68	0.62
PVF (20%)	1	0.83	0.69	0.58	0.48	0.41

Required:

(i) Calculate the NPV and IRR of each project.

(ii) State with reasons which project you would recommend.

(iii) Explain the inconsistency in ranking of two projects. [(4+5)+(5+3+3)]

Answer: 9. (a)

Calculation of Joint Probability:

Branch	Initial Probability	Conditional Probability*	Joint Probability
	A	B	A × B
1	0.20	0.25	0.05
2	0.20	0.25	0.05
3	0.20	0.50	0.10
4	0.60	0.10	0.06
5	0.60	0.80	0.48
6	0.60	0.10	0.06
7	0.20	0.50	0.10
8	0.20	0.25	0.05
9	0.20	0.25	0.05
Total			1.00

1. NPV of 9 Branches

Branch	Yr 1 Cash Flow(000s)	PV factor @ 8% Yr-1	Yr 2 Cash Flow(000s)	PV Factor @8% Yr 2	NPV(₹)= -Cash Outflow + (A×B+C×D)
	A	B	C	D	
1	- ₹200	0.926	- ₹1,500	0.857	-1670700
2	- ₹200	0.926	- ₹1,100	0.857	-1327900
3	- ₹200	0.926	- ₹700	0.857	-985100
4	₹200	0.926	- ₹300	0.857	-271900
5	₹200	0.926	₹100	0.857	70900
6	₹200	0.926	₹500	0.857	413700
7	₹600	0.926	₹900	0.857	1126900
8	₹600	0.926	₹1,300	0.857	1469700
9	₹600	0.926	₹1,700	0.857	1812500

Branch	NPV (₹)	Joint Prob(p_i)	Expected NPV (₹) $\overline{NPV}$	Variance=p_i.(NPV-$\overline{NPV}$)^2
	A	**B**	**X= A×B**	**(in 000000)**
1	-1670700	0.05	-83535	151658.5
2	-1327900	0.05	-66395	97832.07
3	-985100	0.10	-98510	111513.6
4	-271900	0.06	-16314	7050.71
5	70900	0.48	34032	0
6	413700	0.06	24822	7050.71
7	1126900	0.10	112690	111513.6
8	1469700	0.05	73485	97832.07
9	1812500	0.05	90625	151658.5
		$\overline{NPV}$	70900	736109.8

Expected Value = 70900

Standard Deviation = $\sqrt{736109.8}$x1000 = 857980

Answer: 9. (b)

(i) Computation of NPV and IRR
For Project X:

Years	**Cash flows ₹ '000**	**PVF 10%**	**P.V. ₹ '000**	**PVF 10%**	**P.V. ₹ '000**
0	-500	1.00	-500.00	1.00	-500.00
1	85	0.91	77.35	0.83	70.55
2	200	0.83	166.00	0.69	138.00
3	240	0.75	180.00	0.58	139.20
4	220	0.68	149.60	0.48	105.60
5	70	0.62	43.40	0.41	28.70
	NPV		+116.35		-17.95

NPV of Project X at 10% (Cost of Capital) is ₹ 1,16,350.

IRR of Project X may be calculated by interpolation method as under:

NPV at 20% is (-) 17.95 (₹ '000)

NPV at 10% is + 116.35 (₹ '000)

$$\therefore \text{IRR} = 10 + \frac{116.35}{116.35 - (-17.95)} (20 - 10)\% = 18.66\%$$

For Project Y:

Years	Cash flows ₹ '000	PVF 10%	P.V. ₹ '000	PVF 10%	P.V. ₹ '000
0	-500	1.00	-500.00	1.00	-500.00
1	480	0.91	436.80	0.83	398.40
2	100	0.83	83.00	0.69	69.00
3	70	0.75	52.50	0.58	40.60
4	30	0.68	20.40	0.48	14.40
5	20	0.62	12.40	0.41	8.20
	NPV		+105.10		+30.60

NPV of Project Y at 10% (Cost of Capital) is ₹ 1,50,100.

IRR of Project Y may be calculated by interpolation method as under:

NPV at 10% is = + 105.10 (₹ '000)

NPV at 20% is = + 30.60 (₹ '000)

$$\text{IRR} = 10 + \frac{105.10}{105.10 - 30.60} (20 - 10)\% = 24.10\%$$

(Note: Though in above solution discounting factors of 10% and 20% have been used. However, instead of 20%, students may assume any rate beyond 20%, say 26%, and then NPV becomes negative. In such a case, the answers of IRR of Project may slightly vary from 24.10%.)

(ii) The ranking of the projects will be as under:

	NPV	IRR
Project X	1	2
Project Y	2	1

There is a conflict in ranking. IRR assumes that the project cash flows are reinvested as IRR whereas the cost of capital is 10%. The two projects are mutually exclusive. In the circumstances, the project which yields the larger NPV will earn larger cash flows. Hence the project with larger NPV should be chosen. Thus Project X qualifies for selection.

(iii) Inconsistency in ranking arises because if NPV criterion is used, Project X is preferable. If IRR criterion is used, Project Y is preferable. The inconsistency is due to the difference in the pattern of cash flows.

Where an inconsistency is experienced, the project yielding larger NPV is preferred because of larger cash flows which is generates. IRR criterion is rejected because of the flowing reasons:

- IRR assumes that all cash flows are re-invested at IRR.
- IRR is a percentage but the magnitude of cash flow is important.
- Multiple IRR may arise if the projects have non-conventional cash flows.

Question 10.

(a) Nizam Toys Ltd. has a new project for the manufacture of remote controlled toy car. The product is a novelty in the toy market. The company had already spent an amount of ₹ 7,20,000 in developing the product and is eager to place it in the market as quickly as possible. The company estimates a five-year market life for the product. The maximum number it can produce in any given year is limited to 36 lakh units. The expected market scenario will support a sale equivalent of 20%, 50%, 100% and 30% of the capacity in 1st year, 2nd year, 3rd year, 4th year and 5th year respectively.

Investment in the project is expected to be completed in one year and will have the following major components: (₹ Lakhs)

Land, buildings and civil works	**12.50**
Machinery and equipments	**87.50**
Interest during construction	**8.00**

Cost structure of the toy is as given below:

Materials	**₹ 2.00**
Conversion cost excluding depreciation	**₹ 1.00**

Materials are required to be held in stock for 15 days at an average while finished goods may be held for up to 60 days. Production cycle is 12 days. Credit expectancy of the market is 30 days both on sale and purchases. It is the usual practice of the company to keep a cash-in-hand reserve for 15 days expenses not provided for specifically elsewhere in the working capital estimates.

Working capital requirements should be worked out on the above basis for the first year. Same level in terms of money will be maintained in the subsequent years, though composition may change.

The following assumptions are made:

- **The project will be financed by a combination of equity and term loans in a ratio as close to 30:70 as practicable.**
- **Loans will carry an interest of 20% p.a.**
- **Loan disbursement will be uniform throughout the period of construction, simple interest at the same rate will be applied.**
- **Selling price per unit will be ₹ 6.**

- **One year moratorium on the principal will be available.**
- **Product promotion expenses for the first three years will be ₹ 2.00 lakhs, ₹ 1.00 lakh and ₹ 0.50 lakh respectively.**
- **Production is prorated every month equally.**
- **The factory operates one shift for 360 days in a year.**
- **Ignore interest on overdraft.**
- **Working capital requirement will not increase after the initial first year.**

Calculate:

(i) Initial working capital required.

(ii) Total financial investment in the project and its financing.

(iii) Profit before depreciation and interest charges for 5 years.

(iv) Debts service coverage ratio.

(b) The paid-up capital of a company is ₹ 100 lakh. It has been declaring 20% dividend for the last 5 years.

It has under consideration an expansion programme involving an investment of ₹ 100 lakh and its board of directors desires to raise the dividend to 25%. The expansion programme can be financed by four alternatives – A) 100% equity; B) 18% institutional loan (debt) and equity 50:50; C) Equity and debt, 70:30; and D) 100% debt. Income tax and dividend tax rate are 35% and 10% respectively.

Assuming rate of return as X, analyse the various financing alternatives from the point of view of taxes. [(4+4+3+3)+6]

Answer: 10. (a)

(i) Computation of Initial working capital required :

1st year production and sales = 36,00,000 units x 20/100 = 7,20,000 units.

Particulars	**Norm**	**Computation**	**Amount (₹)**
Materials	15 days	(7,20,000 x 2 x 15/360)	60,000
Work-in-progress	12 days	(7,20,000 x 1.5 x 12/360)	36,000
Finished goods	60 days	(7,20,000 x 3 x 60/360)	3,60,000
Debtors	30 days	(7,20,000 x 3 x 30/360)	1,80,000
Cash	15 days	(7,20,000 x 1 x 15/360)	30,000

			6,66,000

Assumption – 360 days in a year and 30 days in a month.

(ii) Statement showing investment in the project and its financing :

Particulars	Amount (₹)
Cost of project	
Land, building and civil works	12,50,000
Machinery and equipment	87,50,000
Product development	7,20,000
Interest during construction	8,00,000
Initial working capital	6,66,000
	1,21,86,000
Means of finance	
Equity capital	33,86,000
Loans	80,00,000
Overdraft for interest	8,00,000
	1,21,86,000

Debt-equity ratio is 7:3 (basing long-term debt of ₹ 80 lakhs

(iii) Statement showing profit before depreciation and interest charges for 5 years (₹ Lakhs)

Year		**1**	**2**	**3**	**4**	**5**
Sales (units in lakhs)		**7.20**	**18.00**	**36.00**	**36.00**	**10.80**
Sales revenue	(a)	43.20	108.00	216.00	216.00	64.80

Expenses					
Materials	14.40	36.00	72.00	72.00	21.60
Conversion expenses	7.20	18.00	36.00	36.00	10.80
Promotion	2.00	1.00	0.50	-	-
(b)	23.60	55.00	108.50	108.00	32.40
Profit before depreciation and interest (a) – (b)	19.60	53.00	107.50	108.00	32.40

(iv) Statement showing debt service coverage ratio (DSCR) **(₹ Lakhs)**

Year	**1**	**2**	**3**	**4**	**5**
Profit before interest and depreciation (a)	19.60	53.00	107.50	108.00	32.40
Finance charges :					
Interest	16.00	16.00	12.00	8.00	4.00
Principal repayment	-	20.00	20.00	20.00	20.00
(b)	16.00	36.00	32.00	28.00	24.00
DSCR (a)/(b)	1.225	1.472	3.359	3.857	1.350

Answer: 10. (b)

Effect of taxes on Financing Alternatives

(₹ In lakhs)

Particulars	**A**	**B**	**C**	**D**
Return on ₹ 100 lakh	100X	100X	100X	100X
Less : Interest (0.18)	-	9	5.4	18
Balance	100X	100X -9	100X – 5.4	100X – 18
Less : Tax (0.35)	35X	35X – 3.16	35X – 1.9	35X – 6.30

Balance	655X	65X – 5.86	65X – 3.52	65X – 11.70
Add : Distributable profit before expansion (0.20 x ₹ 100 lakh)	20	20	20	20
Total profits available for distribution (a)	20 + 65X	14.14 + 65X	16.48 + 65X	8.30 + 65X
Expected rate of dividend (%)	25	25	25	25
Expected dividend [0.25 x (₹ 100 lakh + new capital)]	50	37.50	42.50	25
Dividend tax (0.10)	5	3.76	4.26	2.50
Total of dividend and dividend tax (b)	55	41.26	46.76	27.50
Rate of return (value of X) to pay dividend and dividend tax [value of X if (a) = (b)]%	54*	42	47	30

*20 + 65X = 55 or, X = 35/65 = 54%; other values are also determined like this.