FINAL EXAMINATION

(REVISED SYLLABUS - 2008)

GROUP - III

Paper-12 : FINANCIAL MANAGEMENT & INTERNATIONAL FINANCE

Q. 1. (a) For each of the questions given below, one out of four answers is correct. Indicate the correct answer and give your workings/ reasons briefly.

(i) Money market hedge involves—

A. Borrowing in foreign currency in case of exports

B. Investing in foreign currency in case of imports

C. Both A and B

D. Neither of the above

(ii) A company has obtained quotes from two different manufacturers for an equipment. The details are as follows :

Product	Cost (₹ *Million*)	*Estimated life* (*years*)
Make X	4.50	10
Make Y	6.00	15

Ignoring operation and maintenance cost, which one would be cheaper? The company's cost of capital is 10%.

[Given : PVIFA (10%, 10 years) = 6.1446 and PVIFA (10%, 15 years) = 7.6061]

A. Make X will be cheaper

B. Make Y will be cheaper

C. Cost will be the same

D. None of the above

(iii) An Indian company is planning to invest in US. The US inflation rate is expected to be 3% and that of India is expected to be 8% annually. If the spot rate currently is ₹ 45/ US$, what spot rate can you expect after 5 years?

A. ₹ 59.09/US$

B. ₹ 57.00/US$

C. ₹ 57.04/US$

D. ₹ 57.13/US$

(iv) **ABC Ltd. has a debt-equity mix of 30/70. If ABC Ltd.'s debt beta is 0.3 & for its activity (or projects) is 1.21, what is the beta for its equity?**

    A. 1.65

    B. 1.60

    C. 1.52

    D. None of the above

(v) **ABC Ltd. intends to invest ₹ 50 lakhs in commercial paper (CP) and has received the following quotes from a prima dealer : Bid 5.30%, Ask 5.00%. If the maturity period of the CP is 45 days, the investment amount (rounded upto nearest rupee) will be (Assume day count basis as "actual/ 365").**

    A. ₹ 49,67,541

    B. ₹ 49,68,454

    C. ₹ 49,69,367

    D. None of the above

(vi) **The equity shares of MNP Ltd. are selling at ₹ 240 each. At the end of the holding period the share is expected to be worth any one of the following values :**

Price	₹ 220	₹ 250	₹ 250
Probability	0.3	0.4	0.3

    A European call option with exercise price of ₹ 240 will (ignoring time value of money) be worth :

    A. ₹ 16

    B. ₹ 15

    C. ₹ 14

    D. ₹ 18

(vii) **On April 1, 3 months interest rate in the US$ and Germany DM are 6.5% and 4.5% per annum respectively. The US$/DM spot rate in 0.6560. What would be the forward rate for DM for delivery on 30th June?**

    A. US$ 0.6592/DM

    B. US$ 0.6528/DM

    C. US$ 0.6430/DM

    D. US$ 0.6525/DM

(viii) **Which of the following is not an assumption of Black and Scholes Model (BSM)?**

    A. The risk-free rate of interest is known

    B. No imperfection exist in writing an option

    C. Only European options are considered

    D. Dividend is paid on the shares

(ix) **A company issue commercial paper for ₹ 3 crores with a maturity period of 90 days. The interest rate is 11% p.a. The net amount received by the company will be :**

    A. ₹ 2.94 crores

    B. ₹ 2.92 crores

    C. ₹ 2.85 crores

    D. ₹ 3.08 crores

(x) **A share of Sun Ltd. is currently quoted at** ₹ **55. The retained earning per share being 40% is** ₹ **4 per share. If the investors expect annual growth rate of 10%, what would be the cost of equity of Sun Ltd.?**

    A. 20.5%

    B. 21.0%

    C. 22.0%

    D. 23.5%

Answer 1.

  (i) **C.** **Both A and B are correct.**

    Importer will have FC liability and settle the same with maturity proceeds of FC asset created. Exporter will get the asset value from overseas customer and settle FC liability there itself.

  (ii) **A.** **Make X will be cheaper**

    Make X

Purchase cost	=	₹ 4.50 million	
Equivalent annual cost	=	4.50/6.1446	= ₹ 0.73235 million

    Make Y

Purchase cost	=	₹ 6.00 million	
Equivalent annual cost	=	6.00/7.6061	= ₹ 0.78884 million

    Therefore, equivalent annual cost of make X is lower than make Y, make X is suggested to purchase.

  (iii) **C.** ₹ **57.04/US$**

    According to Purchase Power Parity, spot rate after 5 years

    = ₹ 45 × [(1 + 0.08)/ (1 + 0.03)]^5 = 45 × 1.2675 = ₹ 57.04

  (iv) **B.** **1.60**

$$\beta_A = \beta_d(D/V) + \beta_e(E/V)$$
$$1.21 = (0.30 \times 0.3) + (\beta_e \times 0.7)$$
$$1.21 = 0.09 + 0.7\,\beta_e$$
$$\beta_e = 1.12/0.7 = 1.60$$

  (v) **C.** ₹ 49,69,367

$$\text{Interest yield} = \frac{F-P}{P} \times \frac{365}{\text{Maturity Period}} \times 100$$

$$0.05 = \frac{50,00,000 - P}{P} \times \frac{365}{45}$$

$$0.05 = \frac{50,00,000 \times 73 - 73P}{9P}$$

$$P = \frac{36,50,00,000}{73.45} = 49,69,367$$

    ∴ The investment amount will be ₹ **49,69,367**

(vi) A. ₹ 16

$V_0 = (0.3 \times 0) + 0.4\,(₹\,250 - ₹\,240) + 0.3\,(₹\,280 - ₹\,240)$

$\quad = ₹\,16$

(vii) A. 0.6592/DM

Using Interest Rate Parity

Where S_0 = 0.6560
$\quad\quad i_h$ = 0.065 × 3/12 = 0.01625
$\quad\quad i_f$ = 0.045 × 3/12 = 0.01125

$$\frac{F}{0.6560} = \frac{1+0.01625}{1+0.01125}$$

$$\frac{F}{0.6560} = \frac{1.01625}{1.01125}$$

1.01125F = 1.01625 × 0.6560

$\quad\quad$ F = 0.66666/1.01125 = 0.6592

Forward rate after 3 months
= US$ 0.6592/DM

(viii) D. Dividend is paid on the shares

(ix) B. ₹ 2.92 crores

Interest @ 11% p.a. for 90 days on Re 1.

$= 0.11 \times \dfrac{90}{365} = 0.0271233$

Amount after 90 days = 1 + 0.0271233 = 1.0271233

Net amount received = ₹ 3,00,00,000/1.0271233 = ₹ 2,92,07,788 say ₹ 2.92 crores

(x) C. 22.0%

Retained earnings per share = ₹ 4
EPS $\quad\quad\quad\quad\quad\quad\quad$ = ₹ 4 × 100/40 = ₹ 10
Dividend $\quad\quad\quad\quad\quad$ = ₹ 10 × 60/100 = ₹ 6

Cost of equity $(K_e) = \dfrac{D_0\,(1+g)}{P_0} + g$

$\quad\quad = \dfrac{6\,(1+0.10)}{55} + 0.10 = 0.22$ or 22%

Q. 2. Write short notes on :

    (a) Impact of corporate taxation on corporate financing.

    (b) Scenario Analysis

    (c) Cross border leasing

    (d) Exposure netting

    (e) Difference between Economic Value Added and Accounting Profit

Answer 2.

  (a) The influence of corporate taxation on Corporate Financing can be analysed in the following areas :

    (i) **Financing Decisions – Cost of Capital –** Debt is cheaper than equity since interest payable on loan is a charge on profit and will reduce the tax payable by the Company. The use of cheaper cost debt funds has a leverage effect and increases the EPS of the Company.

    (ii) **Invest decisions – Capital Budgeting –** For project evaluation, the Cash Flows after Taxes (CFAT) are relevant for discounting purposes. Cash outflows may also be reduced due to various deductions and allowances. The incidence of tax on income and on capital gains affect cash flows and investment decisions.

    (iii) **Dividend Decisions – Retention v Payment –** Tax is one of the major considerations in taking decisions on the amount and rate of dividend. Whether the Company should retain all its earnings or distribute all earnings as dividend, also depends on tax incidence on the Company and its Shareholders. The levy of taxes on Dividends pushes the Cost of Equity Capital of the Company.

    (iv) **Evaluation of Cash Flows –** depreciation is not an outgo in cash but it is deductible in computing the income subject to tax. There will be saving in tax on depreciation, and such savings could be profitably employed. Thus, both interest and depreciation provide tax shield and have a tendency to increase EPS.

    (v) **Rehabilitation of Sick Units –** Unabsorbed Depreciation can be carried forward for 8 years, and this can be carried for set off in another Company's profit in case of amalgamations in specified circumstances. Such a provision will help in the growth of Companies and rehabilitation of sick units.

    (vi) **Protection of Internal Funds –** Tax implications should be taken care off in choosing the size and nature of industry and incentives are given for backward areas. Tax considerations are relevant for purpose of preserving and protecting internal funds.

  (b) Scenario analysis is an analysis of the NPV or IRR of a project under a series of specific scenarios, based on macro-economics, industry and firm-specific factors.

    The steps in a scenario analysis are –

Step	Description of procedure
1.	The biggest source of uncertainty for the future success of the project is selected as the factor around which scenarios will be built.
2.	The values of each of the variables in the investment analysis (revenues, growth, operating margin etc.) will take on under each scenario are estimated.
3.	THE NPV and IRR under each scenario are estimated.
4.	A decision is made on the project, based on the NPV under all scenarios, rather than just the base case (i.e. mean NPV).

Limitations :

(a) There are no clearly declined scenario in many cases.

(b) If there are many important variables to consider, there may give rise to a huge number of scenarios for analysis.

(c) There is no clear roadmap to indicate how the decision-maker use results of the scenario analysis.

Best case and Worst case analysis- These are variants of the scenario analysis.

(a) In a Best case analysis, all the inputs are set at the most optimistic levels.

(b) In a worst case analysis, inputs are all measured at the most pessimistic levels, for computing NPV and IRR.

(c) Cross-border leasing is a leasing agreement where lessor and lessee are situated in different countries. This raises significant additional issues relating to tax avoidance and tax shelters. It has been widely used in some European countries, to arbitrage the difference in the tax laws of different countries.

Cross-border leasing have been in practice as a means of financing infrastructure development in emerging nations. Cross-border leasing may have significant applications in financing infrastructure development in emerging nations – such as rail and air transport equipment, telephone and telecommunications, equipment, and assets incorporated into power generations and distribution systems – and other projects that have predictable revenue streams.

A major objective of cross-border leases is to reduce the overall cost of financing through utilization by the lessor of tax depreciation allowances to reduce its taxable income. The tax savings are passed to the lessee as a lower cost of finance. The basic prerequisites are relatively high tax rates in the lessor's country, liberal depreciation rules and either very flexible or very formalistic rules governing tax ownership.

(d) Meaning :

(i) **Offsetting exposures :** Exposure netting is the act of offsetting exposures in one currency with exposures in the same or another currency.

(ii) **Example :** If an entity has Dollar Receivables, which is exposed to currency risk, it may enter into an offsetting position by entering into a Dollar Payable arrangement.

Objective : The objective of netting, is to offset the likely loss in one exposure, with the likely gain in another.

Hedging tool : It is a form of hedging foreign exchange risks. When a Firm opts for exposure netting, it hedges its risk without taking any forward cover or options cover.

Fundamentals for Banking Transactions :

(i) **Application :** Banking transactions are based on the principle of netting. A Bank generally offsets its position in a currency, by taking opposite positions in the same currency.

(ii) **Settlement Risk :** Settlement Netting / Settlement Risk is the difference of the summed transactions between the parties which is actually transferred. Example, A Bank is required to pay USD 1,00,000 and USD 2,75,000 to Mr. A, and collect from him USD 1,75,000, Euro 50,000, then the net payable is called the settlement netting or settlement risk.

Situation for exposure netting : Exposure netting occurs where outstanding positions are netted against one another in the event of counter party default.

(e) Earning profit is not sufficient, a business should earn sufficient profit to cover its cost of capital and surplus to grow. Any surplus generated from operating activities over and above the cost of

capital is termed as Economic Value Added (EVA). Economic Value Added measures economic profit/loss as opposed to accounting profit/loss. EVA calculates profit/loss after taking into account the cost of capital, which is the weighted average cost of equity and debt.

Accounting profit on the other hand ignores cost of equity and thus overstates profit or under states loss.

$$EVA = NOPAT - K \times WACC$$

Where,

NOPAT = Net operating profit after tax = EBIT $(1 - t)$

K = Capital employed (Equity + Debt)

WACC = Weighted average cost of equity and debt.

The estimates are fine-tuned through several adjustments. For instance, NOPAT is estimated excluding non-recurring income or expenditure. PAT is shown in the profit and loss account to include profit available to the shareholders, both preference and equity. Ability to maintain dividend is not a test of profit adequacy.

EVA is the right measures for goal setting and business planning, performance evaluation, bonus determination, capital budgeting and evaluation.

Simply stated Accounting Profit equals Sales Revenue minus all costs except the cost of equity capital, while Economic Profit is Sales Revenue minus all costs including the opportunity cost of equity capital. Thus economic profit may be lower than the accounting profit. If accounting profit equals the opportunity cost of equity capital, economic profit is zero. Only when accounting profit is greater than the opportunity cost of equity capital, economic profit is positive. Under perfect competition, all firms in the long run earns zero economic profit.

Q. 3. (a) "Liquidity and profitability are competing goals for the Finance Manager". Comment.

(b) The Bright Consultants (P) Ltd. is a consultancy firm. Its main business is conducting market studies, surveys and techno-economic feasibility and industry reviews. Its final product is in the form of a printed report. The normal procedure is to produce handwritten drafts of the report and get it printed through an independent word processing service agency. Three copies of each report are prepared for submission to the clients.

On an average 35 surveys are completed every year. The average size of the report is 100 pages. In addition, about 50 proposals are sent in duplicate to various companies every year, the average size of these being 20 pages. The reports as well as the proposals are in laser print on bond paper. The handwritten drafts (printed 3 times for reports and 2 times for proposals) are on ordinary paper.

The external word processing is done at a rate of ₹ 10 per page with one draft free of cost. The variable overheads are 2 telephone calls a day to the word processing agency for 300 days @ Re 1 per call.

Recently, the firm has been offered a computer system with software and laser printer for ₹ 1,20,000. The system would have no salvage value at the end of 5 years. The maintenance cost of the system would include ₹ 5,000 on account of annual maintenance contract and ₹ 15,000 for spares. The annual insurance of the system is likely to be 1% of the cost. The other associated annual costs are expected to be as follows :

(i) Cost of bond paper Re. 0.35 per sheet; cost of ordinary paper @ Re 0.18 per sheet. The experience has been that there is 10% wastage of both bond and ordinary paper sheets;

(ii) Laser toner, Re 0.10 per sheet;

(iii) Draft print at Re 0.05 per sheet;

    (iv) Power charges, ₹ 3,000;

    (v) Telephone charges, ₹ 100;

    (vi) Manpower charges, ₹ 3,000 per month as salary of a part-time computer operator;

    (vii) Additional working capital requirement, ₹ 25,000.

The firm is in the 30% tax bracket. Assuming it would use written down value method of depreciation at the rate of 20% and its required rate of return is 10%, should the Bright Consultants (P) Ltd. install its own computer system as an alternative to hiring word processing service from an outside agency? Assume further that the company does not have any other asset in the 20% block.

Answer 3. (a)

Ezra Solomon states that "liquidity measures a company's ability to meet expected as well as unexpected requirements of cash to expand its assets, reduce its liabilities and cover up any operating losses." The balancing of liquidity and profitability is one of the prime objectives of a Finance Manager. One of the important problems faced by Finance manager is the dilemma of liquidity vs. profitability. Liquidity ensures the ability of the firm to honour its short-term commitments. The liquidity means the firm's ability to pay trade creditors as and when due, ability to honour its bills payable on due-dates, ability to pay salaries and wages on time when it is due, ability to meet unexpected expenses etc. It also reflects the firm's ability to convert its assets into cash, cash equivalents and other most liquid assets. The liquidity of the firm indicates the ability of the organization to realize value in money, and its ability to pay in cash the obligations that are due for payment. To maintain concern's liquidity, the Finance manager is expected to manage all its current assets and liquid assets in such a way as to ensure its effectivity with a view to minimize its costs. Under profitability objective, the Finance manager has to utilize the funds in such a manner as to ensure the highest return. Profitability concept signifies the operational materials, money and machines. It refers to a situation in terms of efficiency in utilization of resources to achieve profit maximization for the owners.

There is an inverse relationship between profitability and liquidity. The higher the liquidity the lower will be the profitability and vice versa. Liquidity and profitability are competing goals for the Finance manager. Under liquidity management, the Finance manager is expected to manage all its current assets including near cash assets in such a way as to ensure its effectivity with a view to minimize costs. Sometimes, even if the profit from operations is higher, the firm may face liquidity problems due to the fact theat the amount representing the profit may be in the form of either in fixed assets like plant, buildings etc. or in the form of current assets like inventory, debtors – other than in the form of cash and bank balances. In situations where the firm faces the liquidity problems, will hamper the working of the company which result in lower profitability of the firm. If, more assets of the firm are held in the form of highly liquid assets it will reduce the profitability of the firm. Lack of liquidity may lead to lower rate of return, loss of business opportunities etc. Therefore, a firm should maintain a trade-off situation where the firm maintains its optimum liquidity for greater profitability and the Finance manager has to strike a balance between these two conflicting objectives. If, more assets of the firm are held in the form of highly liquid assets, it will reduce the profitability of the firm.

Answer 3. (b)

Financial analysis to purchase computer system

Cash outflows :	₹
Cost of computer system	1,20,000
Increased working capital required	25,000
Initial investment required	1,45,000

Incremental CFAT and NPV   ₹

Particulars	Year				
	1	**2**	**3**	**4**	**5**
Savings in word processing cost :					
- Reports (35 × 3 x 100 × ₹ 10)	1,05,000	1,05,000	1,05,000	1,05,000	1,05,000
- Proposals (50 × 20 × 2 × ₹ 10)	20,000	20,000	20,000	20,000	20,000
Savings in telephone costs [(300 × 2) − 100]	500	500	500	500	500
	1,25,500	1,25,500	1,25,500	1,25,500	1,25,500
Less : **Incremental costs**					
Insurance (0.01 × ₹ 1,20,000)	1,200	1,200	1,200	1,200	1,200
Maintenance cost	20,000	20,000	20,000	20,000	20,000
Paper cost :					
- Bond paper (12,500* × Re 0.35 × 1.1)	4,813	4,813	4,813	4,813	4,813
- Ordinary paper (12,500* × Re 0.18 × 1.1)	2,475	2,475	2,475	2,475	2,475
Toner cost (Laser) (12,500* × 0.1 × 1.1)	1,375	1,375	1,375	1,375	1,375
Toner cost (Draft) (12,500* × 0.05 × 1.1)	688	688	688	688	688
Power charges	3,000	3,000	3,000	3,000	3,000
Manpower changes	36,000	36,000	36,000	36,000	36,000
Depreciation	24,000	19,200	15,360	12,288	Nil
Earnings before taxes	31,949	36,749	40,589	43,661	55,949
Less : Taxes	9,585	11,025	12,177	13,098	16,785
Earnings after taxes	22,364	25,724	28,412	30,563	39,164
CFAT (EAT + Depreciation)	46,364	44,924	43,772	42,851	39,164
Tax benefit on short-term capital loss (₹ 49,152@ × 0.30)					14,746
Working capital recovery					25,000
PV Factor (0.10)	0.909	0.826	0.751	0.683	0.621
Present value	42,145	37,107	32,873	29,267	49,003
Total present value (t = 1 − 5)					1,90,395
Less : Cash outflows					1,45,000
NPV					45,395

Recommendation : Since the net present value for this proposal is positive, the proposal is financially viable and the firm should use the option to install the computer system.

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* 12,500 = [(35 × 100 × 3) + (50 × 20 × 2)]

@ 49,152 = [1,20,000 − (24,000 + 19,200 + 15,360 + 12,288)]

Q. 4. **The following selected financial data have been taken from the annual reports of Multi Products Ltd. You are required to appraise the company's financial position from the point of view of :**

(i) Corporate management, (ii) Lending institutions, and (iii) Investors.

(a) Selected financial statistics   ₹ **in lakhs**

Particulars	(Index : Base Year 1 = 100)		
	Year 10 (Index)	Year 9 (Index)	Year 8 (Index)
Total income	10,615 (498)	9,9093 (427)	8,280 (389)
Depreciation	225 (479)	126 (268)	101 (215)
Profit before tax	803 (453)	815 (46)	540 (305)
Taxation	405 (526)	474 (616)	315 (409)
Profit after tax	398 (398)	341 (341)	225 (225)
Dividend	91 (260)	91 (260)	70 (200)
Retained profit	307 (473)	250 (385)	155 (238)
Fixed assets	1,655 (338)	991 (202)	914 (187)
Investments	177 (385)	165 (358)	165 (358)
Indebtedness	1,097 (213)	885 (172)	760 (148)
Share capital	917 (321)	603 (211)	603 (211)
Reserves	806 (413)	795 (408)	615 (315)
Net worth	1,723 (358)	1,399 (291)	1,218 (253)

(b) Significant ratios

Particulars	Year 10	Year 9	Year 8
(I) Measurement of investment :			
Percentage return on investment	32.7	39.5	32.9
Percentage return on equity	29.9*	25.9	19.7
Dividend cover ratio	4.67*	3.99	3.48
(II) Measurement of performance :			
Percentage of profit before tax to sales	7.7	9.3	6.7
Percentage of profit after tax to sales	3.8	3.9	2.8
Assets turnover ratio	3.6	3.8	4.1
(III) Measurement of financial status :			
Percentage of term loan to tangible net worth	41.1	14.2	19.4
Current ratio	1.25	1.25	1.15
(IV) General :			
Dividend per equity share (₹)	1.60	1.60	1.20
Earnings per equity share (₹)	7.48*	6.39	4.17
(*excluding bonus shares issued on March 31, year 10)			

(c) Statement of changes in financial position ₹ in lakhs

Particulars	Year 10	Year 9
	415.21	341.17
Funds obtained from profit after tax	225.09	125.94
Depreciation	466.30	-
Long-term loans	-	0.44
	1,106.60	467.55
Funds used for : Misc	-	23.05
Repayment of long-term loans	11.97	0.85
Plant expenditure	889.16	202.47
Increase in investment	90.96	161.04
Dividends	114.51	80.14
Increase in working capital	1,106.60	467.55
Changes in working capital : Increase/(decrease)		
Cash and bank balances	274.23	12.08
Inventories	55.63	236.08
Sundry debtors	(66.91)	292.47
Loans and advances	163.20	(0.20)
	426.15	540.43
Creditors and other liabilities	616.80	244.10
Short-term borrowings	(254.30)	197.31
Provision for taxation	(50.86)	18.88
	311.64	460.29
Increase in working capital	114.51	80.14

Answer 4.

(i) Corporate Management – The corporate management of Multi Products Ltd. would be interested in examining all the aspects of the company's financial position, viz. liquidity, solvency, profitability and funds-flow ratios. In the absence of industry average figures, our appraisal is based only upon standard norms of these ratios.

An examination of the statement of changes in financial position revels that the company is relying largely on funds from business operations (profit after tax plus depreciation) to finance its major expansion programmes of the purchase of plant. While in year 9, all the plant expenditure of ₹ 202.47 lakh was financed through internally-generated funds, in year 10 also, a substantial part of plant expenditure (₹ 889.16 lakh) was supported by the funds from business operations. To fill up the gap, the company raised a long-term loan of ₹ 466.3 lakhs. As a result, there has been nearly a three-fold increase in term loans to tangible net worth in year 10 compared to year 9, the respective figures being 41.1 and 14.2 per cent. But the increase in debt should not be regarded as alarming because the company is performing very well on the profitability front. The rate of return on the firm's investment is 32.7 per cent in year 10. Though the rate of interest on borrowings is not mentioned, it is likely to be much less than the rate of return. The qualitative feature of increased debt would be that it would improve the rate of return for equity holders. The rate of return on equity which gets improved from 19.7 in year 8 to 29.9 in year 10 is likely to go up in future years. From these facts, it can be reasonably concluded that the company is following sound financial practices.

However, the fluctuations in the rate of return on investment and the downward trend in assets turnover are matters of concern and require further probe. While the rate of return on investment has declined from 39.5 in year 9 to 32.7 per cent in year 10, the assets turnover has declined from 4.1 times in year 8 to 3.6 times in year 10. It is perhaps due to the fact that the company's newly purchased plants in year 10 may not have gone into commercial production so far. If it is so, the situation should not be a cause of worry. Otherwise, the reasons for low turnover should be investigated.

The short-term liquidity position of the company cannot be considered very satisfactory. It is true that the current ratio has gone up to 1.25 in year 10 from 1.15 in year 8, yet it is still lower than the standard norm of 2. The low current ratio of the company may perhaps be due to the fact that the company is largely using its internally generated savings in financing acquisition of plant. The management must take steps to improve this ratio to ensure better liquidity.

The increase in creditors in year 10 is an additional pointer in this direction. However, the increase in cash balances by ₹ 274.23 lakh in year 10, net working capital by ₹ 114.51 lakh and reduction in debtors by ₹ 66.91 lakh in the current year are some improvements in the company's liquidity position. Still, the management should not lose sight of the fact that when the new plant goes into commercial production, there will be additional need of working capital. Therefore, the company should strengthen its working capital position.

(ii) **Lending Institutions –** A lending institution, in the case of short-term loans, is concerned with examining the company's liquidity position. In the case of term-loans, however, the emphasis of the lending institutions is more on firm's earning position and its existing debt-equity proportions because the repayment of the principal depends on the firm's ability to generate profits. Debt-equity ratio gives an idea of the proportion of assets financed by each group. The lending institutions obviously prefer a low debt equity ratio. Thus, the lending institutions will like to examine (i) profitability of the company, (ii) earnings cover for interest, (iii) debt equity ratios, and (iv) increase in retained earnings.

From the point of view of granting short-term credit to the company, the firm's position is not very satisfactory as its current ratio is below the standard of 2, although it has recorded improvement. However, the increase in net working capital and cash balances in year 10 are favourable offsetting factors.

From the point of view of granting long-term loans to the company, its position seems to be very satisfactory. The interest coverage ratio would be very high. There is also an adequate margin of safety of funds as the present ratio of term loans to net worth is 41.1 per cent. The firm's retained earnings are showing a consistent upward trend.

(iii) **Investors –** An investor is primarily concerned with four things : (i) earnings per share, (ii) dividend per share, (iii) intrinsic value per share, (iv) prospectus of growth in the market value of the share. The analysis of the financial data of Multi Products Ltd. indicates an upward trend in all these respects. The EPS has gone up from ₹ 4.17 in year 8 to ₹ 7.48 in year 10; the dividend cover has also gone up from ₹ 1.20 to 1.60 during the same period. The intrinsic value of the shares is going up: the rate of return on equity investment has gone up from 19.7 per cent in year 8 to 29.9 per cent in year 10; its retained earnings have also gone up. The company has already issued bonus shares and holds promise of issuing more in future in terms of reserve balances of a staggering figure of ₹ 806 lakhs. The dividend cover ratio is also constantly improving. It has gone up from 3.48 times in year 8 to 4.67 times in year 10. The increased dividend of Re 0.40 should be viewed in terms of a larger number of equity shares. From all these facts, it can reasonably be concluded that the chances of increase in the market value of the shares of the company are very high.

In conclusion, it may be said that from the point of view of all parties (except short-term creditors), the overall performance of the company is very satisfactory. It should improve its position on the liquidity front. It is also required to increase the working capital in view of the new plant going into commercial production.

Q. 5. (a) A company is trying to decide whether to invest in a new project. Two mutually exclusive projects are available, each requiring a investment of ₹ 3,00,000. Project A is expected to generate cash inflows of ₹ 2,00,000 per year in the next 2 years. It is estimated that the cash inflows associated with project B would either be ₹ 1,80,000, or ₹ 2,20,000 (each with 0.5 probability of occurrence) next year. If ₹ 1,80,000 is received in the first year, the cash inflow for the second year is likely to be ₹ 1,50,000 (probability of 0.3), ₹ 1,80,000 (probability of 0.4) and ₹ 2,00,000 (probability of 0.3). In case the first year's cash inflow is ₹ 2,20,000, the second year's likely cash inflow would be ₹ 1,80,000 and ₹ 2,70,000 (each with 0.3 probability), and ₹ 2,20,000 (probability 0.4).

The firm uses a 14 per cent minimum required rate of return for deciding whether to invest in projects comparable in risk to the ones under consideration.

(i) Calculate the risk adjusted expected NPV for projects A and B.

(ii) Identify the best and the worst possible outcomes for B.

(iii) Which of the projects, if any, would you recommend? Why?

(b) The shares of MSoft which is an all equity firm, are trading at 12 times to their face value. The company has the practice of paying 40% of its earnings to its owners. It has just paid a dividend of ₹ 12 lakhs. Dividend yield on shares is 8%. Face value of each share is ₹ 10. The company is planning to buyback some of its shares, which is proposed to be financed with the borrowings of ₹ 60 lakhs from a bank. As the terms of the loan agreement, bank imposes interest rate of 12% on borrowing up to ₹ 40 lakhs and 14% beyond that. The tax rate applicable to the firm is 40%. You are required to :

(i) Determine the effect on EPS on the action.

(ii) Determine the percentage of shares to be bought back, if the firm wants to maintain the EPS at 50% above the current EPS.

Answer 5. (a)

(i) Determination of expected NPV of Project A

Year	CFAT (₹)	PV factor (0.14)	Total PV (₹)
1	2,00,000	0.877	1,75,400
2	2,00,000	0.769	1,53,800
Total present value			3,29,200
Less : PV of cash outflows			3,00,000
NPV			29,200

Decision Tree

Determination of expected NPV of Project B   ₹

Time 0		1		CFAT$_2$	NPV at 14%	Joint probability	Expected NPV
		1,80,000 ⌐	0.3	1,50,000	(26,790)	0.15	(4,019)
		→ CFAT ├	0.4	1,80,000	(3,720)	0.20	(744)
Cost of the	0.5	∟	0.3	2,00,000	11,660	0.15	1,749
project							
(₹ 3,00,000)	0.5	⌐	0.3	1,80,000	31,360	0.15	4,704
		→ CFAT ├	0.4	2,20,000	62,120	0.20	12,424
		2,20,000 ∟	0.3	2,70,000	1,00,570	0.15	15,085
							29,199

(ii) The worst possible outcome is a CFAT of ₹ 1,80,000 (year 1) and ₹ 1,50,000 (year 2) with the maximum negative NPV as ₹ 26,790.

The best possible outcome is when NPV is maximum, ₹ 1,00,570. It results when CFAT in year 1 is ₹ 2,20,000, followed by ₹ 2,70,000 in year 2.

(iii) The expected NPVs are the same for both projects. However, from the point of view of risk, project A should be chosen as there is no variability of possible events.

Answer 5. (b)

Market price : Current price of MSoft = MPS = 12 × 10 = ₹ 120

Number of shares :

Given that dividend yield is 8%

Therefore, DPS/MPS = 8%

Multiplying the number of shares in the denominator and numerator, we get :

Total Dividend Paid / Market capitalization = 8%

Since total dividend paid = ₹ 12 lakhs;

Total market cap = 12 lakhs/ 8% = ₹ 150 lakhs

Since MPS = ₹ 120, Number of shares = ₹ 150 lakhs/ ₹ 120 = 1,25,000

Earning per share :

Total dividend paid = ₹ 12 lakhs

Payout ratio = 40%

Thus 100% would represent total earnings = 12/0.4 = ₹ 30 lakhs

Therefore current EPS = ₹ 30 lakhs / 1,25,000 = ₹ 24

Price-Earnings Ratio (P/E) :

P/E = MPS/EPS = 120/24 = 5

Effect of buyback :

(i) Buyback is planned for ₹ 60 lakhs. In a buyback the following has to be maintained:

In an ideal situation, the market price after buyback should match the buyback price and the following rule should be satisfied.

Market Capitalization before buyback = Market Capitalization after buyback

₹ 150 lakhs = Number of shares post buyback x Buyback Price

Let the buyback price be P, the number of shares bought back = 60 lakhs/P

Thus we get :

150 lakhs = [1,25,000 – (60 lakhs/P)] × P

Solving we get, P = ₹ 168

The buyback is funded using bank borrowing which entails interest equivalent to :

= 40,00,000 × 12% + 20,00,000 × 14% = ₹ 7.60 lakhs

Since interest expenses are tax deductible the net post tax cost = 7.60 lakhs × (1 – 0.4) = ₹ 4.56 lakhs

Because of buyback the EPS will increase as number of shares get reduced, but because of borrowing EPS will reduce. Let us calculate the effect on EPS, which is currently ₹ 24 per share.

Present earnings = ₹ 30 lakhs

Owing to payment of interest on borrowings, reduction in earnings net of tax :

= ₹ 30 lakhs - ₹ 4.56 lakhs = ₹ 25.44 lakhs

Number of shares post buyback = Original shares less shares bought back

= 1,25,000 – ₹ 60 lakhs/168 = 89,286 shares

EPS = Total present earnings/ Total present outstanding shares = ₹ 28.49

Increase in EPS = 28.49/24 – 1 = 18.71%

(ii) Now the EPS has to be maintained at 50% above the current level i.e. the desired EPS post buyback net of deduction of interest has to be 1.5 × ₹ 24 = ₹ 36 per share.

Therefore, Previous Earnings – Interest paid net of tax = Current Earnings = ₹ 36 × Number of shares outstanding post buyback.

The left hand side of the above equation = ₹ 30 lakhs - ₹ 4.56 lakhs = ₹ 25.44 lakhs

Therefore, number of shares outstanding post buyback = 25.44 lakhs/36 = 70,667

Thus shares bought back = 1,25,000 – 70,667 = 54,333.

Q. 6. (a) Explain the term "Swaps". Outline the possible benefits to a Company of undertaking an Interest rate swap.

(b) Bharat Ltd. provides you with following figures –

Particulars	₹
Profit before interest and tax	**3,00,000**
Less : **Interest on debentures @ 12%**	**(60,000)**
Profit before tax	**2,40,000**
Less : **Income tax @ 35%**	**(84,000)**
Profit after tax	**1,56,000**
No. of equity shares (₹ 10 each)	**40,000**
Earnings per shares (EPS)	**3.9**
Ruling price in market	**39**
Price earning (P/E) ratio (Price/EPS)	**10**

The company has undistributed reserves of ₹6,00,000. The company needs ₹2,00,000 for expansion. This amount will earn at the same rate as funds already employed. You are informed that a debt-equity ratio (debt to total funds) higher than 35% will push the P/E ratio down to 8 and raise the interest rate of additional amount borrowed to 14%.

You are required to ascertain the probable price of the share –

(i) If the additional funds are raised as debt; and

(ii) If the amount is raised by issuing equity shares.

Answer 6. (a)

Swaps, as the name implies, are exchange / swap of debt obligations (interest and/or principal payments) between two parties. These are of two types, namely interest swaps and currency swaps. While interest swaps involve exchange of interest obligations between two parties, currency swaps involve two parties who agree to pay each other's debt obligations denominated in different currencies.

Benefits of Interest rate swap :

(i) A company can lower its overall interest burden by making use of the comparative advantage; it has of borrowing in one market compared with another company that has a comparative advantage in another market.

(ii) A company that is paying one type of interest can switch to paying another type of interest, for example from fixed to floating or floating to fixed rates.

(iii) Swaps can be a more cost effective way of reducing interest rate risk than other hedging methods.

(iv) A company can change the structure of its borrowing without giving to terminate existing loan arrangements, and hence incur early termination costs.

(v) Swaps are more flexible than other methods of hedging – there are no prescribed sums or periods of swaps. Swaps can be reversed as required by swapping with another counter party.

Answer 6. (b)

Computation of average return on capital employed
(Before current year's profit)
Computation of capital structure

Particulars		₹
Equity share capital	[40,000 shares of ₹ 10 each]	4,00,000
Reserves and surplus	[Undistributed reserves]	6,00,000
Total equity of the company		10,00,000
Add: 12% debentures	[Debenture interest ₹ 60,000 ÷ Interest Rate 12%]	5,00,000
Total capital employed		15,00,000

Computation of return on capital employed

Return on Capital Employed = Profit before interest and tax ÷ Capital Employed

= ₹ 3,00,000 ÷ ₹ 15,00,000

= 20%

Current Debt Equity Ratio [Debt to Total Funds]

Debt ÷ Total Funds = ₹ 5,00,000 ÷ ₹ 15,00,000

= 33.33%

Price of share after expansion ₹

Particulars/ Expansion funded by	Borrowal	Equity
Capital employed before expansion	15,00,000	15,00,000
Add : Additional funds deployed	2,00,000	2,00,000
Total capital employed	17,00,000	17,00,000
Capital structure		
Debt [For borrowal existing 5,00,000 + Additional 2,00,000]	7,00,000	5,00,000
Equity [For equity existing 10,00,000 + Additional 2,00,000]	10,00,000	12,00,000
Debt to total funds	41.17%	29.41%
	[7/17]	[5/17]
Debenture interest rate for additional debentures	14%	N.A.
Profit before interest and tax (PBIT) [20% on ₹ 17,00,000]	3,40,000	3,40,000
Less : Debenture interest : Existing [₹ 5,00,000 × 12%]	(60,000)	(60,000)
New [₹ 2,00,000 × 14%]	(28,000)	-
Profit before tax (PBT)	2,52,000	2,80,000

Less : Income tax @ 35%		(88,200)	(98,000)
Profit after tax		1,63,800	1,82,000
Total number of shares	[See note]	40,000	45,128
Earnings per share (EPS)	[Earnings ÷ No. of shares]	₹ 4.095	₹ 4.033
Price earning ratio [P/E ratio]		8	10
Price per share	[EPS × PE Ratio]	₹ 32.76	₹ 40.33

Additional equity raised : Assumed that additional equity is raised by issue of shares at Market rate of ₹ 40.33 per share. Therefore, number of shares issued will be = Amount raised ₹ 2,00,000 ÷ Price per share ₹ 40.33 = 4,959. Therefore, Total Number of shares outstanding under equity funding route = Existing 40,000 shares + Fresh issue 4,959 shares = 44,959 shares.

Q. 7. (a) ABC Ltd. needs a machine which if purchased outright will cost ₹ 10 lakhs. A hire purchase and leasing company has offered two alternatives as below :

Option A : Hire Purchase : ₹ 2,50,000 will be payable on signing of the agreement. 3 annual installments of ₹ 4,00,000 will be payable at the end of the year starting from year 1. The ownership in the machine will be transferred automatically at the end of the 3rd year. It is assumed that ABC Ltd. will be able to claim depreciation on straight line basis with zero salvage value.

Option B : lease : ₹ 20,000 will be payable towards initial service fee upon signing of the agreement. Annual lease rent of ₹ 4,32,000 is payable at the end of each year starting from the first, for a period of 3 years.

ABC Ltd's tax rate is 35%.

Evaluate the two alternatives and advise the company as to which one implies least cost.

(b) Under an advance factoring arrangement XYZ Ltd. has advanced a sum of ₹ 14 lakhs against the receivables purchased from Supreme Ltd. The factoring agreement provides for an advance payment of 80% (maintaining "Factoring Reserve" of 20% to provide for dispute and deductions relating to the bills assigned) of the value of factored receivables and for guaranteed payment after three months from the date of purchasing the receivables. The advance carries a rate of interest of 20% p.a. compounded quarterly and the Factoring Commission is 1.5% of the value of factored receivables. Both the interest and commission are collected up-front.

Required :

- Compute the amount of advance payable to Supreme Ltd.
- Calculate the effective cost of funds made available to Supreme Ltd., assuming that the interest is collected in arrear and commission is collected in advance.

Answer 7. (a)

Determination of incremental interest rate (Taking HP interest rate as a proxy)

Particulars	Amount in ₹
Amount of finance availed	7,50,000
(cost of the machine ₹ 10 lakhs *Less* : Down payment ₹ 2.5 lakhs)	
Amount of hire purchase installment for each of the 3 years	4,00,000
Since present value of ₹ 4 lakhs for 3 years must be ₹ 7.5 lakhs, the relevant annuity factor for the 3 year period = (₹ 7.5 lakhs / ₹ 4 lakhs)	1.875

From present value annuity table, for a 3 year – period, annuity factor for 27% is 1.896 and that for 28% is 1.868. On intrapolation, the required discount rate is [27% + (21/28) × 1%] = 27.75%

So, after tax incremental interest rate   = Incremental interest rate (1 – Tax rate)

= 27.75% (1 – 0.35) = 18%

Option A : Hire Purchase
Calculation of finance charges

Year	HP installments (₹)	Finance charges (₹)	Cash price (₹)
0	2,50,000	-	2,50,000
1	4,00,000	2,25,000	1,75,000
2	4,00,000	1,50,000	2,50,000
3	4,00,000	75,000	3,25,000
	14,50,000	4,50,000	10,00,000

Note :

(a)   The total charges allocated in the ratio of HP price outstanding i.e., 3:2:1.

(b)   Annual depreciation = ₹ 10,00,000/ 3 = ₹ 3,33,333.

Calculation of cash outflow

Year	HP installments (₹)	Tax shield @ 35% on Finance charges + Depreciation (₹)	Net outflow (₹)
0	2,50,000	-	2,50,000
1	4,00,000	1,95,417	2,04,583
2	4,00,000	1,69,167	2,30,833
3	4,00,000	1,42,917	2,57,083

Computation of discounted cash flows

Year	Cash outflow (₹)	PVF @ 18%	Discounted cash outflow (₹)
0	2,50,000	1.000	2,50,000
1	2,04,583	0.847	1,73,282
2	2,30,833	0.718	1,65,738
3	2,57,083	0.609	1,56,564
		Total	7,45,584

Option B : Leasing
Calculation of cash flows

End of the year	Lease charges (₹)	Tax shield @ 35% (₹)	Net of tax outflow (₹)
0	20,000	-	20,000
1	4,32,000	1,51,200	2,80,800
2	4,32,000	1,51,200	2,80,800
3	4,32,000	1,51,200	2,80,800

Computation of discounted cash flows

Year	PVF @ 18%	Cash outflow (₹)	Discounted cash outflow (₹)
0	1.000	20,000	20,000
1	0.847	2,80,800	2,37,838
2	0.718	2,80,800	2,01,614
3	0.609	2,80,800	1,71,007
		Total	6,30,459

Conclusion : Since the present value of cash outflows under Option B is less than that of Option A, Option B i.e. Lease option implies least cost.

Answer 7. (b)

Computation of net advance payable to Supreme Ltd.

Particulars		₹ in lakhs
Advance payment payable		14.00
Value of factored receivables	[Adv. Payable ₹ 14/ Extent of advance on r'bles 80%]	17.50
Maximum permissible advance		14.00
Less : Commission	[Value of receivables ₹ 17.50 × 1.50%]	(0.26)
Less : Interest charge	[Amount of advance ₹ 14.00 × 20% × ¼ quarters]	(0.70)
Net funds made available to Supreme Ltd.		13.04

Effective rate
Interest and Commission collected in advance

Particulars		Value
Interest charge	[₹ lakhs – collected in advance]	0.70
Commission charge	[₹ lakhs – collected in advance]	0.26
Total cost charged in advance		0.96
Net funds made available		13.04
Total cost as a percentage of funds made available	[₹ 0.96 lakhs ÷ ₹ 13.04 lakhs]	7.36%
Annualized rate of cost	[$(1 + 0.0736)^4 – 1$] = 1.3285 – 1 = 0.3285	32.85%
Interest cost as a percentage of funds made available	[₹ 0.70 lakhs ÷ ₹ 13.04 lakhs]	5.37%
Annualized rate of cost	[$(1 + 0.0537)^4 – 1$] = 1.2327 – 1 = 0.2327	23.27%

Interest collected in arrears and commission collected in advance

Particulars		Value
Total cost to Supreme Ltd.	[As computed above]	0.96
Net funds as made available		13.04
Add : Interest collected in arrears		0.70
Net funds made available to Supreme Ltd. for its use		13.74
Total cost as a percentage of funds made available	[₹ 0.96 lakhs ÷ ₹ 13.74 lakhs]	6.99%
Annualized rate of cost	[$(1 + 0.0699)^4 – 1$] = 1.3103 – 1 = 0.3103	31.03%
Interest cost as a percentage of funds made available	[₹ 0.70 lakhs ÷ ₹ 13.74 lakhs]	5.09%
Annualized rate of cost	[$(1 + 0.0509)^4 – 1$] = 1.2197 – 1 = 0.2197	21.97%

Q. 8. The current sales of FM Ltd. are ₹ 312 lakhs. The sales projections of the firm put its next year's sales at ₹ 328 lakhs. The company management is considering lengthening its terms of sale to give a boost to its top-line. Such a measure is likely to slow down its receivables turnover. As a result, the blockage of funds in receivables will increase because the receivables conversion period is likely to increase from 30 days to 45 days. However, the projected sales of ₹ 355 lakh in the first year is what the management is aiming to achieve by this change in credit policy.

The rate of growth in top-line for the proposed policy is expected to be 10% compared to 9% under the present policy. Variable cost-to-gross sales ratio for the firm is 0.75 and is likely to be maintained in the near future as well. The appropriate risk-adjusted discount rate for the cash flows is 15%. Expected life of the product being sold by the company is 5 years.

The production equipment currently in place will have to be replaced at the end of fourth year to increase the production capacity. The expected cost of replacement would be ₹ 210 lakh. The equipment can be scrapped at a value of ₹ 175 lakh at the end of the project.

If the firm implements the proposed credit policy, the CAPEX for increasing capacity additional capacity will be made at the end of the second year for ₹ 275 lakh and will have a salvage value of ₹ 100 lakh.

The firm's policies are such that the inventory turnover is 25 times a year with this ratio based on gross sales. Under the present policy, the total bad debts is 1.5% of sales. Under the proposed policy, this is likely to increase to a level of 2% of the sales. Collection costs for the firm is not likely to change if the new policy is adopted. The firm does not offer a cash discount.

The firm is in 38.5% tax brackets and depreciates its assets from their initial value to their expected salvage value by the straight line method. It is anticipated that the inventory and the receivables shall fetch their book value.

Should the firm make proposed changes in its terms of sales?

Answer 8.

Present policy

Facts of the problem	
Last year's gross sales (₹ lakhs)	312
Next year's gross sales (₹ lakhs)	328
Growth rate	0.09 (or 9%)
Receivables turnover (in days)	30
Bad debt expenses (as % of sales)	0.015
Discount rate	0.15
Inventory turnover (times)	25
Variable cost ratio	0.75
Tax rate	0.35

	Years					
	0	**1**	**2**	**3**	**4**	**5**
Gross sales	312.00	328.00	357.52	389.70	424.77	463.00
Sales net of bad debts	307.32	323.08	352.16	383.85	418.40	456.05
Receipts :						
Accounts receivables balance	25.61	26.92	29.35	31.99	34.87	38.00
Cash receipt from sales	281.71	321.77	349.73	381.21	415.52	452.92
Payments :						
Inventory balance	12.48	13.12	14.30	15.59	16.99	18.52
Increase in the inventory	-	0.64	1.18	1.29	1.40	1.53
Cost of goods produced for sale	-	246.00	268.14	292.27	318.58	347.25
Total cost of goods produced for sale	-	246.64	269.32	293.56	319.98	348.78
Capital expenditure	-	-	-	-	210.00	-
Salvage value of new equipment	-	-	-	-	-	175.00
Income tax calculations :						
Sales net of bad debts	-	323.08	352.16	383.85	418.40	456.05
Cost of goods produced for sale	-	246.00	268.14	292.27	318.58	347.25
Depreciation	-	-	-	-	-	35.00
Earnings before tax	-	77.08	84.02	91.58	99.82	73.80
Taxes (@ 38.5%)	-	29.68	32.35	35.26	38.43	28.41
Earnings after tax	-	47.40	51.67	56.32	61.39	45.39
Computation of NPV :						
Cash receipts from sales	-	321.77	349.73	381.21	415.52	452.92
Total cost of goods produced for sale	-	246.64	269.32	293.56	319.98	348.78
Capital expenditure	-	-	-	-	210.00	-
Salvage value of new equipment	-	-	-	-	-	175.00
Recovery of receivables	-	-	-	-	-	38.00
Recovery on inventory	-	-	-	-	-	18.52
Taxes paid	-	29.68	32.35	35.26	38.43	28.41
Net cash flow	-	45.451	48.067	52.393	-152.892	307.247
PV factor @ 15%	-	0.869	0.756	0.657	0.572	0.497
PV of net cash flow	-	39.497	36.339	34.422	-87.454	152.702
Total NPV (₹ lakhs)	-	-	-	-	-	**175.51**

Proposed policy

Facts of the problem	
Last year's gross sales (₹ lakhs)	312
First year's gross sales (₹ lakhs)	355
Growth rate	0.09 (or 9%)
Receivables turnover (in days)	45
Bad debt expenses (as % of sales)	0.02 or 2%
Discount rate	0.15
Inventory turnover (times)	25
Variable cost ratio	0.75
Tax rate	0.385

	Years					
	0	**1**	**2**	**3**	**4**	**5**
Gross sales	312.00	355.00	386.95	421.78	459.74	501.11
Sales net of bad debts	305.76	347.90	379.21	413.34	450.54	491.09
Receipts :						
Accounts receivables balance	38.22	43.49	47.40	51.67	56.32	61.39
Cash receipt from sales	342.63	375.30	409.07	445.89	486.02	
Payments :						
Inventory balance	12.48	14.20	15.48	16.87	18.39	20.04
Increase in the inventory	-	1.72	1.28	1.39	1.52	1.66
Cost of goods produced for sale	-	266.25	290.21	316.33	344.80	375.83
Total cost of goods produced for sale	-	267.97	291.49	317.72	346.32	377.49
Capital expenditure	-	-	275.00	-	-	-
Salvage value of new equipment	-	-	-	-	-	100.00
Income tax calculations :						
Sales net of bad debts	-	347.90	379.21	413.34	450.54	491.09
Cost of goods produced for sale	-	266.25	290.21	316.33	344.80	375.83
Depreciation	-	-	-	58.33	58.33	58.33
Earnings before tax	-	81.68	89.00	38.68	47.41	56.92
Taxes (@ 38.5%)	-	31.44	34.26	14.89	18.25	21.92
Earnings after tax	-	50.21	54.73	23.79	29.15	35.01
Computation of NPV :						
Cash receipts from sales	-	342.63	375.30	409.07	445.89	486.02
Total cost of goods produced for sale	-	267.97	291.49	317.72	346.32	377.49
Capital expenditure	-	-	275.00	-	-	-
Salvage value of new equipment	-	-	-	-	-	100.00
Recovery of receivables	-	-	-	-	-	61.39
Recovery on inventory	-	-	-	-	-	20.04
Taxes paid	-	31.44	34.26	14.89	18.25	21.92
Net cash flow	-	43.23	-225.46	76.46	81.32	268.05
PV factor @ 15%	-	0.869	0.756	0.657	0.572	0.497
PV of net cash flow	-	37.567	-170.448	50.234	46.515	133.221
Total NPV (₹ lakhs)	-	-	-	-	-	**97.09**

Since the NPV from the present credit policy is higher than the NPV from the proposed credit policy, any change in credit policy is likely to erode value. Hence, it is suggested that the firm retains its present credit policy.

Q. 9. (a) ABC Ltd. wishes to find out its weighted marginal cost of capital, WMCC, based on target capital structure proportions. Using the data given below, find out the WMCC and also show the WMCC curve.

Source	Proportion	Range	Cost
Equity share capital	**50%**	**Upto ₹ 3,00,000**	**13.00%**
		3,00,000 – 7,50,000	**13.30 %**
		7,50,000 and above	**15.50%**
Preference shares	**10%**	**Up to ₹ 1,00,000**	**9.33%**
		1,00,000 and above	**10.60%**
Long term debt	**40%**	**Up to ₹ 4,00,000**	**5.68%**
		4,00,000 – 8,00,000	**6.50%**
		8,00,000 and above	**7.10%**

(b) Write short note on Common Size Statement.

Answer 9. (a)

**Determination of breaking points of different sources :**

Source	Proportion	Cost	Range	Breaking points
Equity share capital	50%	13.00%	Upto ₹ 3,00,000	3,00,000/0.50 = 6,00,000
		13.30 %	3,00,000 – 7,50,000	7,50,000/0.50 = 15,00,000
		15.50%	7,50,000 and above	-
Preference shares	10%	9.33%	Up to ₹ 1,00,000	1,00,000/0.10 = 10,00,000
		10.60%	1,00,000 and above	-
Long term debt	40%	5.68%	Up to ₹ 4,00,000	4,00,000/0.40 = 10,00,000
		6.50%	4,00,000 – 8,00,000	8,00,000/0.40 = 20,00,000
		7.10%	8,00,000 and above	-

Now, the WMCC for different ranges of new financing may be calculated as follows :

Range	Source	Proportion	Cost %	Proportion × Cost %
Up to ₹ 6,00,000	Equity shares	0.50	13.00	6.50
	Preference shares	0.10	9.33	0.93
	Long term debt	0.40	5.68	2.27
		WMCC		**9.70**
₹ 6,00,000 – 10,00,000	Equity shares	0.50	13.30	6.65
	Preference shares	0.10	9.33	0.93
	Long term debt	0.40	5.68	2.27
		WMCC		**9.85**

₹ 10,00,000 – 15,00,000	Equity shares	0.50	13.30	6.65
	Preference shares	0.10	10.60	1.06
	Long term debt	0.40	6.50	2.60
	WMCC			**10.31**
₹ 15,00,000 – 20,00,000	Equity shares	0.50	15.50	7.75
	Preference shares	0.10	10.60	1.06
	Long term debt	0.40	6.50	2.60
	WMCC			**11.41**
₹ 20,00,000 and above	Equity shares	0.50	15.50	7.75
	Preference shares	0.10	10.60	1.06
	Long term debt	0.40	7.10	2.84
	WMCC			**11.65**

The WMCC curve for the firm has presented in the following figure.
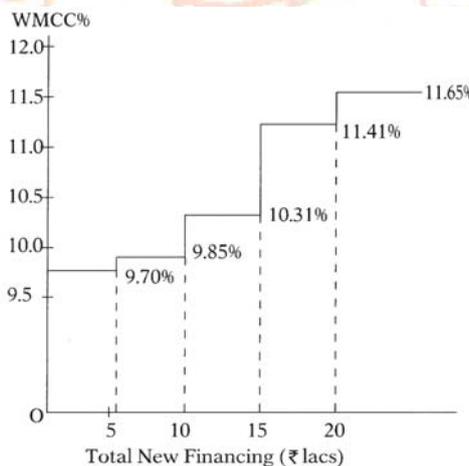
Answer 9. (b)

The common-size statement is a financial document that is often utilized as a quick and easy reference for the finances of a corporation or business. Unlike balance sheets and other financial statements, the common-size statement does not reflect exact figures for each line item. Instead, the structure of the common size statement uses a common base figure, and assigns a percentage of that figure to each line item or category reflected on the document.

A company may choose to utilize financial statements of this type to present a quick snapshot of how much of the company's collected or generated revenue is going toward each operational function within the organization. The use of a common-size statement can make it possible to quickly identify areas that may be utilizing more of the operating capital than is practical at the time, and allow budgetary changes to be implemented to correct the situation.

The common size statement can also be a helpful tool in comparing the financial structures and operation strategies of two different companies. The use of percentages in the common size statements removes the issue of which company generates more revenue, and brings the focus on how the revenue is utilized within each of the two businesses. Often, the use of a common-size statement in this manner can help to identify areas where each company is utilizing resources efficiently, as well as areas where there is room for improvement.

Q. 10. Omega Paints Ltd. is a leading manufacturer of decorative and industrial paints in India. The income statement and the balance sheet for the current year are given. Its sales next year are estimated to be 25 per cent higher on account of increase in demand for paints from the housing and commercial real estate sectors. The variable costs as percentage to sale are likely to remain constant. An increase of 12.5 per cent is estimated in fixed costs.

Omega Paints is planning to launch two new brands of luxury emulsions – Supercoat and Luxurycoat. The Supercoat paint would generate an additional ₹ 600 crore sales and require an extra ' 400 crore investment involving installation of manufacturing and packaging machinery. While the additional fixed costs requirement would be ₹ 150 crore, variable cost to sales ratio would not change. For manufacturing the Luxurycoat paint the additional investment requirement and sales generated would amount to ₹ 600 crore and ₹ 800 crore respectively. The variable cost ratio would remain constant but the fixed cost are expected to increase by ₹ 240 crore. The Omega has four alternative financing plans to choose from. Its current debt-equity ratio is 5:1.

Omega Paints has hired you as a financial consultant to carry out the following tasks :

i. What would its operating, financial and total leverages be next year without the new proposal?

ii. Assuming that the Omega Paints finances the projects using financing plan (A), determine the three leverages for the two projects individually. Which new brands is better?

iii. Which financing option should Omega choose to if only Supercoat is to be manufactured?

iv. Calculate the financial breakeven points of each plan.

Income Statement and Market Data of current year (₹ crore)

Sales	5,000
Variable costs (0.50)	2,500
Contribution	2,500
Fixed costs	1,000
EBIT	1,500
Interest	500
EBT	1,000
Tax (0.35)	350
EAT	650
Shares outstanding	10
EPS (₹)	65
P/E Ratio	20
Market price per share (MPS) (₹)	1,300

Balance Sheet as at March 31, Current year (₹ crore)

Liabilities	Amount	Assets		Amount
Equity capital	100	Fixed assets		5,850
Reserve and surpluses	900	Current assets :		
10% debt	5,000	Inventory	550	
Current liabilities	950	Receivables	300	
		Cash	250	1,100
	6,950			6,950

Financing Options/ Plans

Plans	Debentures		Equity shares		Preference shares		P/E
	Coupon rate	Amount (₹)	Number (crore)	Face value (₹)	Rate	Amount (₹)	
A	0.12	1,000	-	-	-	-	14
B	-	-	100	10	-	-	30
C	0.11	400	60	10	-	-	20
D	-	-	70	10	0.11	300	28

Answer 10.

(i) Determination of Leverage (Without new proposal)

Degree of operating leverage (DOL) =   = 1.56

Degree of financial leverage (DFL) = EBIT / (EBIT – I) = 1.33
Degree of combined leverage (DCL) = [DOL x DFL] = 2.07

Working note :

Income statement	(₹ crore)
Project Sales (5,000 + 0.25)	6,250
Variable costs (0.50)	3,125
Contribution	3,125
Fixed costs (1,000 + 0.125)	1,125
EBIT	2,000
Interest	500
EBT	1,500
Tax (0.35)	525
EAT	975
EPS (₹)	97.50
P/E Ratio	20
Market price per share (MPS) (₹)	1,950

(ii) Determination of leverage

	Supercoat	Luxurycoat
DOL	2.00	2.50
DFL	1.47	1.82
DCL	2.94	4.55
ROCE (Return on capital employed)	0.375	0.267

Comment : Supercoat is a superior alternative as its leverages are lower and the ROCE is hgher.

Working note :

Income statement (₹ crore)

	Supercoat	Luxurycoat
Sales	600	800
Variable costs (0.50)	300	400
Contribution	300	400
Fixed costs	150	240
EBIT	150	160
Interest	48	72
EBT	102	88
Tax (0.35)	35.70	30.80
EAT	66.30	57.20

(iii) Determination of leverages

Particulars	Financing plans			
	A	B	C	D
DOL	1.59	1.59	1.59	1.59
DFL	1.34	1.30	1.32	1.32
DCL	2.13	2.07	2.10	2.10
Outstanding shares (crore)	10.00	50.00	34.00	38.00
EPS (₹)	104.13	21.45	31.21	27.88
P/E ratio	14	30	20	28
MPS (₹)	1,457.82	643.50	624.22	780.64

Comment : Plan A is preferable as it has the highest MPS.

Working note :

Income statement (₹ crore)

Particulars	Financing plans			
	A	B	C	D
Projected Sales [(5,000+0.25)+600]	6,850	6,850	6,850	6,850
Variable costs (0.50)	3,425	3,425	3,425	3,425
Contribution	3,425	3,425	3,425	3,425
Fixed costs [(1,000+0.125)+150]	1,275	1,275	1,275	1,275
EBIT	2,150	2,150	2,150	2,150
Interest [500 + (400×0.12)]	548	500	517.60	500
EBT (160 × 0.11)	1,602	1,650	1,632.40	1,650
Tax (0.35)	560.70	577.50	571.40	577.50
EAT	1,041.30	1,072.50	1,061.00	1,072.50
Preference dividend (120 × 0.11)	-	-	-	13.20
Earning available for shareholders	1,041.30	1,072.50	1,061.00	1,059.30

(iv) Financial break-even point

$(I + D/PD) \div (1 - t)$

Plan   A = ₹ 548.00 crore (interest)

B = ₹ 500.00 crore (interest)

C = ₹ 517.60 crore (interest)

D = ₹ 520.30 crore [₹ 500 + (₹ 13.20/0.65)]

Q. 11.   (a) In considering the most appropriate capital structure for the Bharat Manufacturers Ltd. (BML), its finance department has made estimate of the interest rate on debt and the cost of equity capital at various levels of debt-equity mix summarized below :

Debt-equity mix (leverage)	Coupon rate (%)	Cost of equity (%)
0	8	12.0
10	8	12.0
20	9	12.5
30	9	13.5
40	10	14.5
50	13	16.0
60	15	20.0
70	18	25.0

The debt is in the form of 10-year redeemable at par ₹ 1,000 debentures with coupon rates varying with the equity-debt ratio and 5 per cent flotation cost. As a matter of policy, BML always keeps 10 per cent of its finances in the form of preference shares carrying 2 per cent extra return compared to the debenture coupon rates. The duration and the floatation costs are similar to debentures.

Required : Assuming (i) 17.5 per cent dividend distribution tax and (ii) corporate tax rate, 35 per cent, determine the optimal capital structure (debt-equity mix) for the BML.

(b) The following is the condensed Balance sheet of NHPC Ltd. at the beginning and end of the year.

Balance Sheets

As at ………………….

Particulars	31.12.2012	31.12.2012
Cash	50,409	40,535
Sundry debtors	77,180	73,150
Temporary investments	1,10,500	84,000
Prepaid expenses	1,210	1,155
Inventories	92,154	1,05,538
Cash surrender value of Life Insurance Policy	4,607	5,353
Land	25,000	25,000
Building, machinery etc.	1,47,778	1,82,782
Debenture discount	4,305	2,867
	5,13,143	5,20,380

Sundry creditors	1,03,087	95,656
Outstanding expenses	12,707	21,663
4% mortgage debentures	82,000	68,500
Accumulated depreciation	96,618	81,633
Allowance for inventory loss	2,000	8,500
Reserve for contingencies	1,06,731	1,34,178
Surplus in P & L A/c	10,000	10,250
Share capital	1,00,000	1,00,000
	5,13,143	5,20,380

The following information concerning the transaction are available :

(i) Net profit for 2012 as per Profit and loss account was ₹ 49,097

(ii) A 10% cash dividend was paid during the year.

(iii) The premium of Life Insurance Policies were ₹ 2,773 of which ₹ 1,627 was charged to Profit and Loss Account of the year.

(iv) New machinery was purchased for ₹ 31,365 and machinery costing ₹ 32,625 was sold during the year. Depreciation on machinery sold had accumulated to ₹ 29,105 at the date of sale. It was sold as scrap for ₹ 1,500. The remaining increase in Fixed Assets resulted from construction of a Building.

(v) The Mortgage Debentures mature at the rate of ₹ 5,000 per year. In addition to the above, the company purchased and retired ₹ 8,500 of Debentures at ₹ 103. Both the premium on retirement and the applicable discount were charged to Profit and Loss Account.

(vi) The allowance for Inventory Loss was created by a charge to expenses in each year to provide for obsolete items.

(vii) A debit to reserve for contingencies of ₹ 11,400 was made during the year. This was in respect of a past tax liability.

You are required to prepare a statement showing the Sources and Applications of funds for the year 2012.

Answer 11. (a)

Determination of Optimum Capital structure :

Degree of leverage	Coupon rate (%) (I)	Preference dividend (%) (D_p)	Cost of equity (K_e)	K_d	K_p	K_o
0	8.0	10.0	12.0	0.0585	0.1256	0.1206
10	8.0	10.0	12.0	0.0585	0.1256	0.1144
20	9.0	11.0	12.5	0.0651	0.1377	0.1143
30	9.0	11.0	13.5	0.0651	0.1377	0.1143
40	10.0	12.0	14.5	0.0718	0.1497	0.1162
50	13.0	15.0	16.0	0.0918	0.1859	0.1285
60	15.0	17.0	20.0	0.1051	0.2100	0.1441
70	18.0	20.0	25.0	0.1251	0.2462	0.1622

Conclusion : The optimum capital structure lies between 20 and 30 per cent of leverage.

Working notes :

$K_d = [I (1 - t) + \text{Flotation costs}/N] \div (RV + SV)/2$

$K_p = [D_p (1 + D_t) + \text{Flotation costs}/N] \div (RV + SV)/2$

Where, I = Interest

$\quad\quad\quad$ D_p = Dividend on preference shares

$\quad\quad\quad$ t = Tax rate

$\quad\quad\quad$ RV = Redemption value

$\quad\quad\quad$ SV = Sale value (face value – flotation cost)

$\quad\quad\quad$ n = Maturity period

$\quad\quad\quad$ D_t = Dividend payment tax

$K_o = (W_d \times K_d) + (W_p \times K_p) + (W_e + K_e)$

It may be noted that 10% debt-equity mix implies 90% shareholders equity (consisting 10% of preference shares and 80% of ordinary shares).

Answer 11. (b)

Statement of Sources and Applications of Funds
For the year ended 31st December 2012

Sources	₹	Applications	₹
Sale of Machinery	1,500	Purchase of machinery	31,365
Trading profit (adjusted)	75,457	Payment for construction of building	36,264
	76,957	Dividend paid	10,000
Add: Decrease in working capital	28,600	Redemption of debentures	13,755
		Tax liability paid	11,400
		Premium on Life Policy (1,146 + 1,627)	2,773
	1,05,557		1,05,557

Workings :

Statement of Change in Working Capital

	2011 ₹		2012 ₹	
Current Assets :				
Cash		50,409		40,535
Sundry debtors		77,180		73,150
Temporary investments		1,10,500		84,000
Prepaid expenses		1,210		1,155
Inventories		92,154		1,05,538
		3,31,453		3,04,378
Less : Current Liabilities :				
Sundry creditors	1,03,087		95,656	
Out. Expenses	12,707		21,663	
		1,15,794		1,17,319
Working capital		2,15,659		1,87,059
Decrease in working capital		-		28,600
		2,15,659		2,15,659

4% Mortgage Debenture A/c.

Dr.   *Cr.*

Particulars	₹	Particulars	₹
To 4% Mortgage debenture holders	13,500	By Balance b/d	82,000
To Balance c/d	68,500		
	82,000		82,000

4% Mortgage Debenture holders' A/c.

Dr.   *Cr.*

Particulars	₹	Particulars	₹
To Bank A/c.	13,755	By 4% Mortgage debenture a/c.	13,500
		By P & L A/c. [(8500 ÷ 100) × 3]	255
	13,755		13,755

Accumulated Depreciation A/c.

Dr.   *Cr.*

Particulars	₹	Particulars	₹
To Building, machinery etc.	29,105	By Balance b/d	96,618
To Balance c/d	81,633	By P & L A/c.	14,120
	1,10,738		1,10,738

Allowance for Inventory Loss A/c.

Dr.   *Cr.*

Particulars	₹	Particulars	₹
To Bal c/d	8,500	By Balance b/d	2,000
		By P & L A/c. (bal. fig.)	6,500
	8,500		8,500

Reserve for Contingencies A/c.

Dr.   *Cr.*

Particulars	₹	Particulars	₹
To Tax liability (paid)	11,400	By Balance b/d	1,06,731
To Balance c/d	1,34,178	By P & L A/c. (bal. fig.)	38,847
	1,45,578		1,45,578

Life Insurance Policy A/c.

Dr.   **Cr.**

Particulars	₹	Particulars	₹
To Bal b/d	4,607	By P & L A/c.	400
To Bank (premium) (2773 – 1627)	1,146	(excess over surrender value)	
		By Balance c/d	5,353
	5,753		5,753

Building and Machinery A/c.

Dr.   **Cr.**

Particulars	₹	Particulars	₹
To Balance b/d	1,47,778	By Accumulated Dep.	29,105
To Bank a/c (Purchase)	31,365	By Bank a/c. (sales)	1,500
To Bank a/c. (bal. fig.)		By P & L a/c. (loss on sale)	2,020
(Construction cost of building)	36,264	By Balance c/d	1,82,782
	2,15,407		2,15,407

Debenture Discount A/c.

Dr.   **Cr.**

Particulars	₹	Particulars	₹
To Balance b/d	4,305	By P & L a/c. (bal. fig.)	1,438
		By Balance c/d	2,867
	4,305		4,305

Profit and Loss A/c.

Dr.   **Cr.**

Particulars	₹	Particulars	₹
To Dividend	10,000	By Balance b/d	10,000
To Life insurance policy	400	By Trading profit (adjusted bal. fig.)	75,457
To Debenture discount	1,438		
To Reserve for contingencies	38,847		
To Allow. For inventory loss	6,500		
To 4% Mort. Debentureholders	255		
To Accumulated depreciation	14,120		
To Building and Mach. (loss)	2,020		
To Bank (life insurance premium)	1,627		
To Balance c/d	10,250		
	85,457		85,457

Q. 12. **A newly formed company has applied for a short-term loan to a commercial bank for financing its working capital requirement.**

As a Cost Accountant, you are asked by the bank to prepare an estimate of the requirement of the working capital for that company. Add 10% to your estimated figure to cover unforeseen contingencies.

The information about the projected Profit and Loss Account of the company is as under :

		₹
Sales		21,00,000
Cost of goods sold		15,30,000*
Gross profit		5,70,000
Administrative expenses	1,40,000	
Selling expenses	1,30,000	2,70,000
Profit before tax		3,00,000
Provision for tax		1,00,000
*Cost of goods sold has been derived as :		
Materials used	8,40,000	
Wages and manufacturing expenses	6,25,000	
Depreciation	2,35,000	17,00,000
Less : Stock of finished goods (10 % produced, not yet sold)		1,70,000
		15,30,000

The figures given above relate only to the goods that have been finished and not to work-in-progress; goods equal to 15% of the year's production (in terms of physical units) are in progress on an average, requiring full materials but only 40% of the other expenses. The company believes in keeping two months' consumption of material in stock.

All expenses are paid one month in arrears' suppliers of material extend 1 ½ months' credit; sales are 20% cash; rest are at two months' credit, 70% of the income-tax has to be paid in advance in quarterly installments.

You can make such other assumptions as you deem necessary for estimating working capital requirement.

Answer 12.

Statement showing the Net Working Capital Estimate of a Company :

Current Assets :	₹	₹	₹
Stock of raw material (2 months) : (₹ 8,40,000 × 2/12)			1,40,000
Work-in-progress :			
Raw materials (₹ 8,40,000 × 15/100)		1,26,000	
Other expenses :			
Wages and manufacturing exp.	6,25,000		
Administrative expenses	1,40,000		
	(7,65,000 × 40%)	3,06,000	4,32,000

Stock of finished goods :			
Stock		1,70,000	
Less : Depreciation 10%			
(i.e. 2,35,000 × 10%)		23,500	1,46,500
Debtors (2 months) :			
Cost of goods sold – Dep. (15,30,000 – 2,11,500)		13,18,500	
[Dep. (2,35,000 – 23,500)]			
Administrative expenses		1,40,000	
Selling expenses			
		1,30,000	
Total		15,88,500	
Less : Cash sales @ 20%		3,17,700	
		(12,70,800 × 2/12)	2,11,800
Cash (say)			50,700
Total investment in current assets			9,81,000
Less : Current liabilities :			
Creditors (1½ months) $\dfrac{(₹\,8,40,000\times1\frac{1}{2})}{12}$		1,05,000	
Lag in payment of expenses (1month) :			
Wages and manufacturing expenses			
(₹ 6,25,000 × 1/12)	=52,083		
Administrative expenses			
(₹ 1,40,000 × 1/12)	= 11,667		
Selling expenses			
(₹ 1,30,000 × 1/12)	= 10,833	74,583	1,79,583
Net working capital			8,01,417
Add : 10% for contingencies			80,142
Estimated working capital requirement			8,81,559

Notes :

1. Depreciation is excluded from the computation of cost of goods sold as it is a non-cash item.

2. Element of profit is excluded here.

3. Assume that cash is required for ₹ 50,700 in order to meet the day-to-day expenses.

Q. 13. A company is evaluating a new venture that will cost ₹ 10 crore. The venture will have a return on investment of 20% and the firm forecasts a 12% growth in earnings from the project. The treasurer has identified the following sources for financing the project :

a. Equity shares to be sold at ₹ 400 per share.

b. Convertible debentures with a 60% coupon to net ₹ 980 (face value ₹ 1,000), and convertible at ₹ 500 per share after 2004.

c. Debentures with warrants with a 60% coupon to net ₹ 980 (face value ₹ 1,000), and with each bond having one warrant entitling the holder to buy one equity share at ₹ 500 after 2004.

The financing decision is being made in the fourth quarter of 2002. Over the past ten years, the company has been growing at a 10% rate of sales and earnings.

The treasurer expects the company to continue to grow at 10% even though the firm has traditionally paid 40% of its earnings as dividends. The treasurer expects equity shares to continue to rise in price. Using the price trend over the past 5 years, he has projected probable market price ranges for the next three years. The historical data and the projections of the treasurer are as below :

Year	Historical market price (₹)	Year	Forecasted	
			Probability (%)	Market price (₹)
2004	220	2010	20	450
2005	250		60	500
2006	330		20	600
2007	270	2011	20	480
2008	380		60	550
2009	450		20	620
		2012	20	500
			60	600
			20	700

The proforma balance sheet and income statement prepared by the treasurer for the year 2009 is shown as below :

Proforma Balance Sheet (December 31, 2009)   ₹ '000

Liabilities	2009	2008	Assets	2009	2008
Equity shares (₹ 10 each)	10,000	10,000	Plant and equipment	2,25,000	2,31,000
Shares premium	40,000	40,000	Less : Accumulated depreciation	62,000	59,000
Retained earnings	1,36,000	1,27,000		1,90,000	1,72,000
Bonds (7%)	90,000	52,000	Inventories	64,000	62,000
Mortgage (6%)	30,000	55,000	Receivables	44,000	45,000
Accounts payable	7,000	6,000	Cash and bank balance	22,000	18,000
Other current liabilities	11,000	10,000	Other current assets	4,000	3,000
	3,24,000	3,00,000		3,24,000	3,00,000

Proforma Income Statement   ₹ '000

	Sales	EBIT	Interest*	EBT	NIAT	EPS
2009	4,20,000	71,500	8,000	63,500	31,750	31.75
2008	3,80,000	65,000	7,000	58,000	29,000	29.00

*Rounded off.

The management was initially impressed by the fact that the new venture will increase sales by ₹ 12 crore. Management is also interested in the expected 12% growth rate of the venture. As per company's financial policy, the firm's debt-asset ratio should not be above 40%.

With the above information and detailed analysis for next 3 years, what will be the long-term sources of financing for the new proposal?

Make suitable assumptions in your answer, wherever necessary figures could be rounded off. Income tax rate applicable to the company is to be taken at 35%.

Answer 13.

Statement showing EPS in 2009 (end) under various financing options   (₹ In lakhs)

Particulars	With existing business	With new business financed by		
		Equity shares	Convertible debt	Debt (+) Warrant
EBIT[1]	786.50	986.50	986.50	986.50
Less : Interest on debt :				
Existing (₹ 9 crore × 0.07) + (₹ 3 crore × 0.06)	81.00	81.00	81.00	81.00
New debt (1,02,040[2] debentures × ₹ 60 per debenture)	-	-	61.22	61.22
Earnings before taxes	705.50	905.50	844.28	844.28
Less : Taxes (0.35)	246.93	316.93	295.50	295.50
Earnings after taxes	458.57	588.57	548.78	548.78
Number of shares (in lakhs)	10.00	12.50[3]	10.00	10.00
EPS (₹)	45.86	47.09	54.88	54.88

Statement showing EPS in 2012 (end) under various financing options   (₹ In lakhs)

Particulars	With existing business	With new business financed by		
		Equity shares	Convertible debt	Debt (+) Warrant
EBIT	951.66[4]	1,202.54[5]	1,202.54	1,202.54
Add : Additional EBIT due to additional funds raised[6]	-	-	-	102.04[7]
Less : Interest on existing debt	81.00	81.00	81.00	81.00
Less : Interest on new debt (in the case of warrant option)	-	-	-	61.22
EBT	870.66	1,121.54	1,121.54	1,162.36
Less : Taxes (0.35)	304.73	392.54	392.54	406.83
EAT	565.93	729.00	729.00	755.53
Number of shares (lakh)	10.00	12.50	12.04[8]	11.02[8]
EPS (₹)	56.59	58.32	60.55	68.56

Statement showing debt (assumed to be long-term) to assets ratio in 2009 and 2012   (₹ In lakhs)

Particulars	With existing business	With new business financed by		
		Equity shares	Convertible debt	Debt (+) Warrant
Year-end 2009				
Total assets	3,240	4,240	4,240	4,240
Existing debt	1,200	1,200	1,200	1,200
Additional debt	-	-	1,020	1,020
Total debt	1,200	1,200	2,220	2,220
Debt/ Assets ratio (%)	37.03	28.30	52.36	52.36
Year-end 2012				
Total assets[9]	3,949.27	5,152.17	5,124.62	5,142.99
Existing debt	1,200	1,200	1,200	1,200
Additional debt	-	-	-	1,020
Total debt	1,200	1,200	1,200	2,220
Debt/Assets ratio (%)	30.39	23.29	23.42	43.19

Recommendation : Though EPS is the highest (at ₹ 52.74) under debt plus warrant plan, it cannot be implemented as debt/ assets ratio exceed 40% (43.19%). IN view of this, the next best alternative is that the company should opt for convertible debt plan as under this plan potential EPS is the maximum (at ₹ 46.576 in 2010 and at ₹ 42.214 in 2007).

Working notes :   (₹ In lakhs)

1. (a) Without new venture

   EBIT (2002)   715.00

   Add : 10% growth   71.50   786.50

   (b) With new venture

   Expected EBIT without new venture   786.50

   Add: 20% growth on ₹ 10 crore new investment (₹ 10 crore × 0.20)   200.00

   986.50

2. Number of new debentures to be issued

   (Amount to be raised ₹ 10 crore/Net proceeds per debenture, ₹ 980)   1,02,040

3. Number of new equity shares to be issued

   (₹ 10 crore/Sale price of equity shares, ₹ 400)   2,50,000

4. EBIT in 2005 = Current EBIT, ₹ 715 lakh x Growth factor @ 10% for 3 yrs. i.e. 1.331   951.66

5. EBIT in 2005 with new business : ₹ 951.66 lakh + (₹ 10 crore

   × 20% ROR × 12% growth factor for 2 yrs. i.e. 1.254 = 250.88 lakh)   1,202.54

6. Determination of expected market price in 2010 to 2012.

Years		
2010	**2011**	**2012**
450 × 0.2 = 90	480 × 0.2 = 96	500 × 0.2 = 100
500 × 0.6 = 300	550 × 0.6 = 330	600 × 0.6 = 360
600 × 0.2 = 120	620 × 0.2 = 124	700 × 0.2 = 140
510	550	600

Since expected market price is higher (at ₹ 550 in 2011 and at ₹ 600 in 2012) than the conversion price (i.e. ₹ 500 after 2002), it is reasonable to assume that debt-holders/ warrant-holders will like to exercise their option, resulting in higher number of equity shares in 2012.

7. In the case of convertible debt, no additional funds will accrue. There will be additional funds in the case of warrant option equivalent to (1,02,040 warrants × ₹ 500 issue price of equity share) = ₹ 510.20 lakh.

As per the principle of conservatism, the ROR likely to be earned on these funds (₹ 510.20 lakh) is ROR promised by a new venture i.e. 20% or existing ROR which-ever is lower. (Conventionally, ROR is computed on existing long-term funds employed in business at book value).

$$\text{ROR (on capital employed)} = \frac{\text{EBIT}}{\text{Equity funds} + \text{Long - term debt}}$$

$$= (₹\ 715\ \text{lakh}/(1860\ \text{lakh} + 1200\ \text{lakh}) = 23.37\%$$

Thus, expected additional EBIT with warrant option is = ₹ 510.20 lakh × 0.2 = 102.04 lakh

8. Number of new equity shares issued
   (i) Convertible debts = 1,02,040 debentures × 2 = 2,04,080
   (ii) Warrants = 1,02,040 × 1   = 1,02,040

9. Increase in retained earnings during 3 years under various options :
   It is computer as per the following ratio :

$$\frac{[\text{EAT (year} - \text{end 2009)} + \text{EAT (year} - \text{end 2012)}]}{2} \times \text{Retention ratio} \times 3\ \text{years}$$

   (i) No new venture $= \dfrac{[₹\ 458.57\ \text{lakh} + ₹\ 565.93\ \text{lakh}]}{2} \times 0.6 \times 3\ \text{years} = ₹\ 922.05\ \text{lakhs}$

   (ii) Issue of equity shares $= \dfrac{[₹\ 588.57\ \text{lakh} + ₹\ 729.00\ \text{lakh}]}{2} \times 0.6 \times 3\ \text{years} = ₹\ 1185.81\ \text{lakh}$

   (iii) Issue of convertible debentures $= \dfrac{[₹\ 548.78\ \text{lakh} + ₹\ 729.00\ \text{lakh}]}{2} \times 0.6 \times 3\ \text{years}$

$$= ₹\ 1150.00\ \text{lakh}$$

(iv) Issue of debt + warrant = $\dfrac{[₹\,548.78\,\text{lakh} + ₹\,755.53\,\text{lakh}]}{2} \times 0.6 \times 3 \text{ years}$

= ₹ 1173.88 lakh

It is assumed that the assets will increase by the amount of increase in retained earnings under various options.

Q. 14. (a) Prakash Ltd. undertook an expansion project at an estimated project cost of ₹ 66 crores with an implementation period of 4 years. At the time of implementation, the actual project cost came to ₹ 96 crores. The details are as under :

Items of cost	Original project cost	Final project cost
Plant and machinery		
Imported	20	40
Indigenous	33	36
	53	76
Building and structure	5	7
Interest capitalized (during construction)	4	5
Pre-production expenses	2	3
Margin money	2	5
	66	96

Following additional information are available :

(i) Imported equipment comprised of purchases from UK amounting to UK Pound 50 lakhs.

The foreign exchange rate was ₹ 20 to UK Pound at the time of calculating original project cost and was ₹ 50 to UK Pound at the time of actual procurement. However, there was a decrease in duties/levies from 100% at the of original project cost estimate to 60% at the time of procurement.

(ii) At the time of preparing original cost estimate the building and structure cost was calculated as 20,000 sq. mt. at average cost of ₹ 2,500 per sq. mt. On completion the actual area of construction came to 26,000 sq. mt.

(iii) Although the indigenous equipment all were ordered on firm cost basis, the increases occurred due to purchase of :

(₹ crores)

One additional press machine	1
Installation of pollution control equipment (to meet pollution control norms)	1
Additional price paid to one particular equipment supplier for change in design	1
	3

(iv) Interest capitalized had changed as compared to original estimate because of additional cost of project.

(v) Pre-production expenses has increased by ₹ 1 crore due to additional Rupee cost in respect of payment of foreign technicians, deputed to supervise erection, in foreign currency (pre determined amount).

(vi) Additional margin money requirement as compared to original estimate is due to increase in manufacturing cost due to increase in cost of inputs.

> You are required to prepare a statement showing itemwise cost variance statement analyzing the variances in suitable accepted heads.

> **(b)** Discuss the major sources available to an Indian Corporate for raising foreign currency finances.

Answer 14. (a)

Statement showing analysis of cost variances   (₹ crores)

Item of cost	Original project cost	Final project cost	Variance	Escalation in cost	Change in scope/ time overrun	Exchange rate variance	Change in duties	Under estimation	Addl. items
						Variation in cost due to			
Plant and machinery									
Imported	20	40	20	-	-	15	5	-	-
Indigenous	33	36	3	1	1	-	-	-	1
	53	76	23	-	-	-	-	-	-
Building and structure	5	7	2	0.5	-	-	-	1.5	-
Interest capitalized (during construction)	4	5	1	-	1	-	-	-	-
Pre-production expenses	2	3	1	-	-	1	-	-	-
Margin money	2	5	3	3	-	-	-	-	-
	66	96	30	4.5	2	16	5	1.5	1

- Since time is not given in the problem, it is assumed that there was no time overrun.
- If there is no time overrun and there is no change in interest rates, the increase in interest capitalization is only due to increase in cost of project due to various causes mentioned in the above variance table.

Total escalation cost of imported plant and machinery   (₹ crores)

Particulars	Original project cost		Final project cost		Variance
Cost in UK Pound 50 lakhs	@ ₹ 20	10	@ ₹ 50	25	15
Add : Duties and levies	@ 100%	10	@ 60%	15	5
		20		40	20

Building and structure

Under estimation = (26,000 sq. mt. − 20,000 sq. mt.) × ₹ 2,500 = ₹ 1.5 crores

$$\text{Escalation cost} = \left(\frac{₹\ 7,00,00,000}{26,000 \text{ sq. mt.}} - ₹\ 2,500 \right) \times 26,000 \text{ sq. mt.}$$

= (₹ 2,692 − ₹ 2,500) × 26,000 sq. mt. = ₹ 0.49 crores.

Answer 14. (b)

The major sources of foreign currency finances are discussed below :

1. **Foreign currency term loan from Financial Institutions :** Financial Institutions provide foreign currency term loan for meeting the foreign currency expenditures towards import of plant, machinery, and equipment and also towards payment of foreign technical know how fees.

2. **Export Credit Schemes :** Export credit agencies have been established by the government of major industrialized countries for financing exports of capital goods and related technical services. These agencies follow certain consensus guidelines for supporting exports under a convention known as the Berne Union. As per these guidelines, the interest rate applicable for export credits to Indian companies for various maturities are regulated. Two kinds of export credit are provided i.e., buyer's and supplier's credit.

   Buyer's Credit : Under this arrangement, credit is provided directly to the Indian buyer for purchase of capital goods and/or technical service from the overseas exporter.

   Supplier's Credit : This is a credit provided to the overseas exporters so that they can make available medium-term finance to Indian importers.

3. **External commercial borrowings :** Subject to certain terms and conditions, the Government of India permits Indian firms to resort to external commercial borrowings for the import of plant and machinery.

   Corporates are allowed to raise up to a stipulated amount from the global markets through the automatic route. Companies wanting to raise more than the stipulated amount have to get an approval of the MOF. ECBs include bank loans, supplier's and buyer's credit, fixed and floating rate bonds and borrowing from private sector windows of Multilateral Financial Institution such as International Finance Corporation.

4. **Euro Issues :** The two principal mechanisms used by Indian companies are Depository Receipts mechanism and Euro convertible Issues. The former represents indirectly equity investment while the latter is debt with an option to convert it into equity.

5. **Issues in foreign domestic markets :** Indian firms can also issue bonds and Equities in the domestic capital market of a foreign country. In recent year, Indian companies like Infosys Technologies and ICICI have successfully tapped the US equity market by issuing American Depository Receipts (ADRs). Like GDRs, ADRs represent claim on a specific number of shares. The principal difference between the two is that the GDRs are issued in the euro market whereas ADRs are issued in the U.S. domestic capital market.

Q. 15. **Neil Ltd. has 1,50,000 equity shares of ₹ 10 each; 12% long-term debt of ₹ 12,00,000 outstanding at the beginning of the year 2012-13. The finance department of the company has generated the following forecast financial statistics for the year 2012-13.**

Return on total assets (ROTA)	**25%**
(EBIT/ Total assets)	
Debt ratio (External liabilities/ equity)	**0.75**
Effective interest rate (EIR)	**10%**
(Interest expenses/ Total liabilities)	
Current assets to fixed assets	**0.60 : 1**
Tax rate	**35%**

The assets, liabilities and equity figures used to compute the above financial statistics are based on forecast balances as at 31.3.2013. The company has no plan to change its equity share capital and long-term debt.

Requirements **:**

 (i) **Prepare the forecast Balance sheet as at 31ˢᵗ Match, 2013 with as many details as possible; and**

(ii) **Forecast earnings per share (EPS). Show necessary workings.**

Answer 15.

Working notes :

Calculation of external liabilities :

Effective rate of interest (EIR) = 0.10 (given)

$$EIR = \frac{Interest\,expense}{Total\,liabilities}$$

$$0.10 = \frac{Interest\,expense}{Interest\,bearing\,debt + Other\,Liabilities}$$

$$0.10 = \frac{12,00,000 \times 0.12}{Interest\,bearing\,debt + Other\,Liabilities}$$

Let, total liabilities be 'x'

$$0.10 = \frac{12,00,000 \times 0.12}{x}$$

$$0.10 = \frac{1,44,000}{x}$$

$$0.10\,x = 1,44,000$$

$$X = 1,44,000/0.10 = 14,40,000$$

∴ Total liabilities = ₹ 14,40,000

Total liabilities − Interest bearing liabilities = Other liabilities

₹ 14,40,000 − ₹ 12,00,000 = ₹ 2,40,000

∴ Other liabilities (non-interest bearing) = ₹ 2,40,000

Calculation of retained profit :

Debt ratio = 0.75 (given)

= 0.75

$$\frac{₹14,40,000}{Equity} = 0.75$$

$$0.75 \times Equity = ₹ 14,40,000$$

$$Equity = 14,40,000/0.75 = ₹ 19,20,000$$

Retained earnings = Total equity − Equity share capital

= ₹ 19,20,000 − ₹ 15,00,000 = ₹ 4,20,000

Calculation of Fixed Assets and Current Assets :

Total Assets = Equity share capital + Retained earnings + Interest bearing debt + Other liabilities

= ₹ 15,00,000 + ₹ 4,20,000 + ₹ 12,00,000 + ₹ 2,40,000

$$= ₹\ 33,60,000$$

$$\text{F.A. + C.A.} = ₹\ 33,60,000$$

$$\text{F.A. + 0.60 F.A.} = 33,60,000$$

$$\text{1.60 F.A.} = 33,60,000$$

$$\text{F.A.} = 33,60,000/1.60 = 21,00,000$$

$$\text{Fixed Assets} = ₹\ 21,00,000$$

$$\text{Current Assets} = 33,60,000 - 21,00,000 = ₹\ 12,60,000$$

(i) Forecast Balance Sheet of Neil Ltd. as at 31st March 2013

Liabilities	₹	Assets	₹
Equity shares (₹ 10 each)	15,00,000	Fixed assets	21,00,000
Retained profit	4,20,000	Current assets	12,60,000
12% long-term debt	12,00,000		
Other liabilities	2,40,000		
	33,60,000		33,60,000

(ii) Calculation of forecast earnings per share :

EPS $= (1 - t)\ [\text{ROTA} + (\text{ROTA} - \text{EIR})\ L/E] \times E/N$

Where,

N $= $ No. of equity shares i.e. 1,50,000

ROTA $= $ Return on Total Assets i.e. 0.25

EIR $= $ Effective interest rate i.e. 0.10

t $= $ Tax rate i.e. 0.35

L/E $= $ External liabilities/ Equity i.e. 0.75

EPS $= (1 - 0.35)\ [0.25 + (0.25 - 0.10) \times 0.75] \times \dfrac{19,20,000}{1,50,000}$

$= 0.65\ (0.3625) \times 12.8 = ₹\ 3.016$

Q. 16. **A newly incorporated company intends to set up a project for the manufacture of three varieties of products. The company has already purchased land and all site development work has been completed and paid from equity fund. The cost of the project is estimated to be as follows :**

		₹ in lakhs
1.	Land and site development	13.30
2.	Building and civil works	14.30
3.	Plant and machinery	129.35
4.	Utilities and fixed assets	10.95
5.	Contingencies and escalations (10% on items 2 and 4 and 5% on item 3)	9.00
6.	Preliminary and pre-operatives	12.30
7.	Interest during construction	10.10
8.	Margin money for working capital	15.70
		215.00

The above project to be financed as per the following :　　　　　　　　　₹ in lakhs

1.	Equity share capital	58.80
2.	Interest free loans from promoters	19.50
3.	Term loans	136.70
		215.00

As a project manager you are required to prepare a statement showing cost of production and profitability (before tax) and debt service coverage ratio on the basis of the following assumptions for consideration of the Board :

i. The installed capacity of the plant would be 846 MT comprising the following :

　　Product A – 216 MT　　　　　Product B – 336 MT　　　　　Product C – 294 MT

ii. Capacity utilization has been assumed as follows :

　　First year　　　　　　　　50% of each product

　　Second year　　　　　　　60% of each product

　　Third year onward　　　　70% of each product

iii. Requirement of raw material at full capacity utilization has been estimated as follows for the three products in aggregate :

Sl. No.	Item	Annual requirement (tones)	Unit rate (₹)
1	X	504.0	2,600
2	Y	8.4	7,000
3	Z	200.0	19,000
4	P	38.2	91,600
5	Q	50.4	27,500

iv. Requirement of packing material at full capacity utilization has been estimated at ₹ 111.80 lakhs.

v. The total cost of power and fuel oil has been estimated at ₹ 4.60 lakhs at full capacity utilization.

vi. Repair and maintenance have been estimated at 1% on building, 2% on plant and machinery and miscellaneous fixed assets.

vii. Administrative and other overheads have been estimated at ₹ 2.00 lakhs and an annual increase of 15% has been considered during subsequent years.

viii. Salary and wages have been estimated at ₹ 10.00 lakhs and an increase of 10% per year has been considered in subsequent years.

ix. Selling expenses have been considered at 10% of the total sales.

x. Selling price for the product has been estimated as under :

　　Product A - ₹ 30/kg.　　　Product B - ₹ 70/kg.　　　Product C - ₹ 45/kg.

xi. For the purpose of projections depreciation to be considered on straight line basis (assuming the life of the project as 10 years and a scrap value of 5%).

xii. Interest on term loan has been considered at 14% and the interest on bank borrowings have been considered at 16.5%.

xiii. Working capital loan for different capacity utilization level has been assumed as follows :

　　50% level - ₹ 25 lakhs,　　60% level - ₹ 30 lakhs　　70% level - ₹ 35 lakhs

xiv. Term loan to be repaid within 6 years from the date of commencement of commercial production.

xv. The calculation to be made for 6 years and relevant assumption may be made.

Answer 16.

(a) Allocation of Contingencies of ₹ 9 lakhs   **₹ lakhs**

Item of asset	Original estimate	Contingencies provisions	Amount rounded off	Total value of assets
Land and site development	13.30	-	-	13.30
Building and civil works	14.30	10%	1.43	15.73
Plant and machinery	129.35	5%	6.47	135.82
Miscellaneous fixed assets	10.95	10%	1.10	12.05
	167.90		9.00	176.90

(b) Allocation of Interest During Construction ₹ 10.10 lakhs   **₹ lakhs**

Items of asset	Asset value	Interest allocated	Value of assets
Building and civil works	15.73	0.97	16.70
Plant and machinery	135.82	8.39	144.21
Miscellaneous fixed assets	12.05	0.74	12.79
	163.60	10.10	173.70

Value of Assets after Allocation of Interest During Construction   **₹ lakhs**

Land and site development	13.30
Building and civil works	16.70
Plant and machinery	144.21
Miscellaneous fixed assets	12.79
	187.00

Value of depreciable assets   **₹ lakhs**

Building and civil works	16.70
Plant and machinery	144.21
Miscellaneous fixed assets	12.79
	173.70

(c) Allocation of pre-operative expenses

As per section 35D of the Income Tax Act, 1961 2.5% of the "cost of the project" can be written off over a period of 10 years. Thus ₹ 215 lakhs × 2.5% = ₹ 5.37 lakhs can be written off over a period of 10 years. The balance amount of pre-operative ₹ 6.93 (i.e. ₹ 12.30 – 5.37) lakhs is to be capitalized and is to be allocated over fixed assets. The capitalization should be done over the site development also. However, for the sake of convenience the capitalization is done over the following three category of assets :

Building and civil works, Plant and machinery, and Miscellaneous fixed assets.

This may be allocated in the ratio of value of depreciable assets as follows :   **₹ lakhs**

Item of asset	Ratio for allocation	Amount allotted	Total
Building and civil works	16.70	0.67	17.37
Plant and machinery	144.21	5.75	149.96
Miscellaneous fixed assets	12.79	0.51	13.30
	173.70	6.93	180.63

Value of fixed assets after allocation of pre-operatives   ₹ lakhs

Land and site development	13.30
Building and civil works	17.37
Plant and machinery	149.96
Miscellaneous fixed assets	13.30
	193.93

Thus, the total value of assets after capitalization of contingencies, interest during construction, and pre-operative etc. are ₹ 193.93 lakhs.

(d) Checking the accuracy of capitalization to check the accuracy of the allocation the following approach can be adopted :

Value of assets after allocation = Cost of project – Margin money for working capital to be written off

= 215.00 – 15.70 – 5.37 = ₹ 193.93 lakhs

Hence, the value of the assets capitalized above is correct.

(e) Depreciation

Depreciation is to be calculated on the straight line basis. Assuming the life of the project is 10 years and the scrap value is 5% the value of the depreciable assets would be :

= 193.93 – 13.30 =	₹ 180.63 lakhs
Building	₹ 17.37 lakhs
Others	₹ 163.26 lakhs
Scrap value @ 5% =	₹ 9.03 lakhs
Annual depreciation =	(180.63 – 9.03) ÷ 10 = 17.16 lakhs

(f) Raw material

Raw material requirement at 100% capacity

Item	Quantity (MT)	Price (₹)	Total (₹)
X	504.00	2,600	13,10,400
Y	8.40	7,000	58,800
Z	200.00	19,000	38,00,000
P	38.20	91,600	34,99,120
Q	50.40	27,500	13,86,000
			1,00,54,320

Raw material requirement   ₹ lakhs

At 50 % capacity	50.27
At 60%	60.33
At 70%	70.38

(g) Packing expenses   ₹ lakhs

At 100%	111.80
At 50%	55.90
At 60%	67.08
At 70%	78.26

(h) Power and fuel expenses

At 100% capacity the expenses on power and fuel would be ₹ 4.60 lakhs.

Capacity utilization	50%	60%	70%
Power and fuel (₹ lakhs)	2.30	2.76	3.22

(i) Repairs and maintenance expenses   ₹ lakhs

Building and civil works	(17.37 × 1/100)	0.17
Plant and machinery (including miscellaneous fixed assets)	(163.26 × 2/100)	3.27
		3.44

(j) Sales realization at 100% capacity   ₹ lakhs

Product A	216 MT × ₹ 30,000	64,80,000
Product B	336 MT × ₹ 70,000	2,35,20,000
Product C	294 MT × ₹ 45,000	1,32,30,000
		4,32,30,000

Sales realization at different levels of capacity   ₹ lakhs

Capacity utilization	50%	60%	70%
Sales realization (₹ lakhs)	216.15	259.38	302.61

(k) Estimation of selling expenses

Selling expenses are to be calculated at 10% of the sales realization   ₹ lakhs

Particulars	1 year	2 years	3 to 6 years
Capacity utilization	50%	60%	70%
Sales realization (₹ lakhs)	216.15	259.38	302.61
Selling expenses (10% of sales)	21.62	25.94	30.26

(l) Power and fuel

Capacity utilization	100%	50%	60%	70%
Power and fuel (₹ lakhs)	4.6	2.3	2.76	3.22

(m) Administration and other overheads   ₹ lakhs

Years	1	2	3	4	5	6
Administration and other overheads (15% increase p.a.)	2	2.3	2.65	3.04	3.5	4.02

(n) Salary and wages   ₹ lakhs

Years	1	2	3	4	5	6
Salary and wages (10% increase p.a.)	10.00	11.00	12.10	13.31	14.64	16.10

(o) Interest on working capital loan   ₹ lakhs

Capacity utilization	50%	60%	70%
Working capital loan	25.00	30.00	35.00
Interest on working capital loan @ 16.5%	4.13	4.95	5.78

(p) Interest on term loan ₹ lakhs

Year	Payment	Balance	Interest @ 14%
1	-	136.70	19.14
2	-	136.70	19.14
3	34.00	102.70	19.14
4	34.00	68.70	14.38
5	34.00	34.70	9.62
6	34.70	-	4.86
	136.70		86.28

(q) Repairs and maintenance on plant & machinery (including misc. fixed assets) ₹ lakhs

Particulars	1	2	3	4	5	6
Opening balance	163.26	147.75	132.24	116.73	101.22	85.71
Depreciation	15.51	15.51	15.51	15.51	15.51	15.51
WDV	147.75	132.24	116.73	101.22	85.71	70.20
2% on opening balance for repairs etc.	3.27	2.96	2.65	2.33	2.02	1.71

(r) Repairs and maintenance on buildings ₹ lakhs

Particulars	1	2	3	4	5	6
Opening Balance	17.37	15.72	14.07	12.42	10.77	9.12
Depreciation	1.65	1.65	1.65	1.65	1.65	1.65
WDV	15.72	14.07	12.42	10.77	9.12	7.47
Repairs @ 1% on opening balance	0.17	0.16	0.14	0.12	0.11	0.09

Statement of cost of production and profitability before tax ₹ lakhs

Years		1	2	3	4	5	6
Raw materials		50.27	60.33	70.38	70.38	70.38	70.38
Packing materials		55.90	67.08	78.26	78.26	78.26	78.26
Power and fuel		2.30	2.76	3.22	3.22	3.22	3.22
Repairs and maintenance		3.44	3.12	2.79	2.45	2.13	1.80
Administration and other overheads		2.00	2.30	2.65	3.04	3.50	4.02
Salaries		10.00	11.00	12.10	13.31	14.64	16.10
Selling expenses		21.62	25.94	30.26	30.26	30.26	30.26
Interest on ways and means		4.13	4.95	5.78	5.78	5.78	5.78
Interest on term loans		19.14	19.14	19.14	14.38	9.62	4.86
Depreciation		17.16	17.16	17.16	17.16	17.16	17.16
Cost of production	(a)	185.96	213.78	241.74	238.24	234.95	231.84
Sales	(b)	216.15	259.38	302.61	302.61	302.61	302.61
Profit before tax	(b) – (a)	30.19	45.60	60.87	64.37	67.66	70.77
Tax @ 35% (assumed)		10.57	15.96	21.30	22.53	23.68	24.77
Profit after tax (PAT)		19.62	29.64	39.57	41.84	44.28	46.00
Available cash inflow (PAT + Depreciation + Interest on term loan)		55.92	65.94	75.87	73.38	71.06	68.02
Necessary payments (term loan repayment + interest)		19.14	19.14	53.14	48.38	43.62	39.56

Debt Service Coverage (DSCR) Ratio = $\dfrac{\text{Available total cash inflow}}{\text{Total necessary payments}} = \dfrac{410.19}{222.98} = 1.84$

Q. 17. (a) NIFTY Index consists of 50 stocks. Its current value is 2,450. If risk-free rate of interest is 6%, find the true value of 1, 2 and 3 months (assume 30, 61, and 92 days away) futures contracts.

      (b) The share of State Bank of India (SBI) has a weight of 7% in the index and is being traded at a price of ₹ 850. SBI has announced a dividend of ₹ 25 per share that will be paid 45 days from now. What will be the impact of this dividend on the prices of the futures?

Answer 17. (a)

The value of futures will exceed the spot price by the cost of carry amount for the period of maturity of futures.

Cost of Carry Model

Risk-free rate of interest	6%	6%	6%
Spot value of index	2450	2450	2450
Days to maturity	30 1 month	61 2 months	92 3 months
Fair value of futures ($F = S_o \times e^{rt/365}$)	2,462.11	2,474.69	2,487.33

Answer 17. (b)

Dividend is like negative cost. It implies reduction of cost of carry. Adjustment of dividend that is payable after some time can be made either to the spot value or the terminal value.
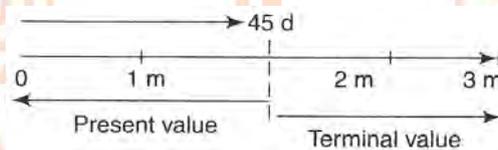
The dividend is payable after 45 days. 1-m futures contract expires before dividend, and hence its price remains unaffected. On the other hand, 2-m and 3-m futures contracts will change in value with the dividend payment. The amount of dividend in the index futures can be worked out as below :

Adjustment of dividend :

Proportion of SBI share	7%
Value of share in the index	172.35
Share price of SBI share (₹)	850.00
Nos. of shares in the index	0.20
Dividend per share (₹)	25.00
Amount of dividend (₹)	5.07
Dividend receivable after t_d days	45
PV of Dividend (₹)	5.03

$D_o = D_1 \times e^{-rt_d/365}$

Spot value of index must be reduced by ₹ 5.03 for 2-m and 3-m futures contracts. Again, applying cost of carry, we get the prices as :

	2m	3m
Price of Index Futures	2,469.61	2,482.23

$F = (S_o - D_o) \times e^{rt/365}$

Alternatively, the terminal value of dividend can be subtracted from the price of the futures.

	1m	2m	3m
Terminal value of dividend	-	5.08	5.11
Price of futures (F – Terminal value of dividend)	2,462.11	2,469.61	2,482.23

Q. 18. Secure Mutual Fund is holding a portfolio of ₹ 50 crore. Due to anticipated rise in the stock markets, they had an aggressive portfolio with a beta of 1.40. However, due to sudden political developments, the markets are not expected to have the rising trend. This political uncertainty is expected to be resolved in one month's time. The mutual fund is convinced of the fundamentals of the securities in the portfolio.

One possible way of overcoming the decline in the value of the portfolio is to sell now and buy after one month. However, this is ruled out in view of the transaction costs involved. Secure Mutual Fund is therefore considering to cover the risk through the futures market.

Current value of index in the Bombay Stock Exchange, is 17,550 while the 1-m futures contract is traded at 17,730.

 (i) With 1 point of Sensex at Re 1.00 and contract size of 50 indices, find out how Secure Mutual Fund can protect against the expected fall in the stock market in next one month.

 (ii) Evaluate the position of the portfolio if Sensex fall to (a) 17,000 and (b) 16,000 after 1 month.

(iii) What conclusion do you draw from the results of (ii)?

(iv) What would be the position of the portfolio if market instead of falling actually rose to 18,000?

What conclusion do you draw from the results of (iv)?

Answer 18.

(i) Current value of BSE Sensex   17,550

Price of 1-m futures on BSE Sensex   17,730

Current value of the portfolio   ₹ 50.00 crore

Beta of the portfolio   1.40

Secure Mutual Fund is long on the asset. They can protect the decline in the value of the asset by going short on the futures. Therefore, they must sell futures contract now equivalent to the exposure. The value that needs to be covered in the futures market is dependent upon the beta of the portfolio.

Value to be covered = Beta × Value of the portfolio

                       = 1.4 × 50 = ₹ 70.00 crore

Current value of 1 futures contract = 17,550

Nos. of Sensex in 1 futures contract = 50

Value of 1 futures contract = ₹ 8.775 lakh

Nos. of futures contracts to be sold = 7,000/8.775 = 797.72 contracts

                                    = 798.00 contracts (rounded off)

At the end of one month, the mutual fund would buy the futures. The price of futures would then be equal to the spot value of the Sensex.

(ii) Sensex moves to 17,000

New value of Sensex   = 17,000

% change in the Sensex   = -3.13%

% change in the value of the portfolio = 1.4 × -3.13% = -4.39%

New value of the port folio = ₹ 47.81 crore

Gain in the futures market

Value of futures sold = 798 x 17,730 × 50   = ₹ 70.74 crore

Value of futures bought = 798 x 17,000 × 50   = ₹ 67.83 crore

Profit/(loss) in the futures market   = ₹ 2.91 crore

Value of the portfolio (at the end of hedge period) = ₹ 50.72 crore

Sensex moves to 16,000

New value of Sensex   = 16,000

% change in the Sensex   = -8.83%

% change in the value of the portfolio = 1.4 × -8.83% = -12.36%

New value of the portfolio   = ₹ 43.82 crore

Gain in the futures market

Value of futures sold = 798 × 17,730 × 50   = ₹ 70.74 crore

Value of futures bought = 798 × 16,000 × 50   = ₹ 63.84 crore

Profit/(loss) in the futures market   = ₹ 6.90 crore

Value of the portfolio (at the end of the hedge period) = ₹ 50.72 crore

(iii) The conclusion that can be drawn from the value of the portfolio with the fall in the Sensex is that the portfolio is protected for any level of fall in the market. The value is ₹ 50.72 crore.

Had the position in the futures market been identical to that of the exposure, the portfolio would have the value of ₹ 50 crore. The minor variation is due to slightly larger exposure in the futures market.

(iv) Sensex moves to 18,500

New value of Sensex   = 18,500

% change in the Sensex   = 5.41%

% change in the value of the portfolio   = 1.4 × 5.41% = 7.58%

New value of the portfolio   = ₹ 53.79 crore

Gain in the futures market

Value of futures sold = 798 × 17,730 × 50   = ₹ 70.74 crore

Value of futures bought = 798 × 18,500 × 50 = ₹ 73.82 crore

Profit/loss in the futures market   = (₹ 3.07 crore)

Value of the portfolio (at the end of the hedge period) = ₹ 50.72 crore

(v) The value of the portfolio remains same even if the Sensex rises instead of falling. By taking the position in futures, Secure Mutual Fund has forgone the opportunity to increase the value of the portfolio to ₹ 53.79 crore if the Sensex rises to 18,500.

Q. 19. (a) Anish Ltd. has to make a US $5 million payment in three months' time. The required amount in dollars is available with Anish Ltd. The management of the company decides to invest them for three months and following information is available in this context :

- **The US $ deposit rate is 9% per annum**
- **The sterling pound deposit rate is 11% per annum**
- **The spot exchange rate is $ 1.82 /pound**
- **The three month forward rate is $1.80/pound.**

Answer the following questions –

(i) **Where should be company invest for better returns?**

(ii) **Assuming that the interest rates and the spot exchange rate remains 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 above, where should the company invest if the sterling pound deposit rate were 15% per annum?**

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

(b) Currently, the spot rate between ¥ and US $ is ¥ 124.058/$. You also know for a fact that purchasing power parity between these two currencies hold when a widget costs $ 5.25 in the U.S. By the end of the year, you expect that same widget to cost $ 5.565 in the U.S. and ¥ 677.357 in Japan. What is your best estimate of the nominal interest rate in US for the coming year if you expect real interest rates in Japan to remain at 1.3%?

Answer 19. (a)

Let's summarize the given data first :

Spot = $1.82/£; 3m Forward = $1.80/£; r_h = 9.0%; r_f = 11.0%

(i) For interest rate parity to hold $(1 + r_h) = (F/S) \times (1 + r_f)$

Now LHS = 1.0225

RHS = $(1+r_f)(F/S)$ = (1.0275)(1.80/1.82) = 1.0162

Since LHS ≠ RHS, IRP is not holding exactly.

Since LHS > RHS the company needs to invest in dollars for better returns.

(ii) For equilibrium, the interest rate parity equation should match i.e. $F/S = (1 + r_h) \div (1 + r_f)$

i.e. $F = S \times [(1 + r_h) \div (1 + r_f)]$ = 1.82 × (1.0225/1.0275) = 1.8111

only if the forward rate F = 1.8111, we have an equilibrium situation.

(iii) Now if Spot = $ 1.82/£; 3 m Forward = $1.80/£; r_h = 9.0%; r_f = 15.0%, we again check whether Interest Rate Parity hold.

Now LHS = 1.0225

RHS = $(1+r_f)(F/S)$ = (1.0375)(1.80/1.82) = 1.0261

Since LHS   RHS, IRP is not holding exactly.

Since RHS > LHS the company needs to invest in pounds for better returns.

(iv) For equilibrium, the interest rate parity equation should match, i.e. $F/S = (1 + r_h) \div (1 + r_f)$

i.e. $(1 + r_f) = S/F \times (1 + r_h)$ = 1.82/1.80 × 1.0225 = 1.03386 or r_f = 3.386% (for 3 months)

only if the annual pound rate is 3.386 × 4 = 13.54%, we have an equilibrium situation.

Answer 19. (b)

According to law of one price (Absolute purchasing power parity) we have :

Exchange rate (A/B) = P_A/P_B

Here P_A refers to price in country A and P_B refers price in country B.

We are given the expected prices at the end of the year for Japan and US. Therefore, we can find the future expected spot price using these expected prices. Secondly, our spot rate is in terms of ¥/$. Thus while substituting prices in the formula we must substitute Yen prices for P_A and dollar prices for P_B. Therefore, we get :

Expected spot rate after 1 year of (¥/$) = 677.357/5.565 = 121.7173

Now we know, spot price today, expected spot price after a year and interest rate of Japan. Using International Fischer Effect, we can find the nominal interest rate in US. We use the formula :

$$\frac{S^e_t}{S} = \frac{1+r_h}{1+r_f}$$

Substituting the required values we get :

$$\frac{121.7173}{124.058} = \frac{1+0.013}{1+r_f}$$

r_f = 3.25%.

Q. 20. The following market data is available :

Deposit rate p.a.	USD	JPY
3 months	4.5%	0.25%
6 months	5.0%	0.25%

Spot USD/JPY116.00; Forward Rate Agreement (FRA) for Yen is nil.

(i) What should be 3 months FRA rate at 3 months forward?

(ii) The 6 & 12 months LIBOR are 5% & 6.5% respectively. A bank is quoting 6/12 USD FRA at 6.50/ 6.75%. Is any arbitrage opportunity available? Calculate profit in such cases.

Answer 20.

(i) We are being asked FRA rate for USD, as it is given that FRA rate for Yen is nil (the rates for 3 and 6 months are same, hence FRA rate is nil). We are given the 6 months rate and the 3 months USD rate. We can find the 3 month FRA, i.e. USD interest rate for the period of 3 months, starting 3 months from now, using the formula :

$$R_f = \frac{R_2 \times T_2 - R_1 \times T_1}{T_2 - T_1}$$

We are given,

R_1 – the spot three months interest rate = 4.5%

R_2 – the spot six months interest rate = 5.0%

R_f – the three month forward rate three months from now

Thus , $R_f = \dfrac{0.05 \times (6/12) - 0.045 \times (3/12)}{(6/12) - (3/12)} = 5.5\%$

(ii) To examine whether we have the arbitrage opportunity, we need to find the implied 'theoretical' FRA rate and compare with the quoted rate. The implied rate for the period of 6 months, starting 6 months from now can be found out using the formula :

We are given,

R_1 – the spot three months interest rate = 5%

R_2 – the spot six months interest rate = 6.5%

R_f – the six month forward rate six months from now

Thus, $R_f = \dfrac{0.065 \times (12/12) - 0.05 \times (6\,/\,12)}{(12/12) - (6/12)} = 8\%$

We can see that the 6 & 12 months LIBORS of 5% & 6.5% respectively imply a rate of return of 8% for the period of six months starting six months from today. And the rate quoted by the bank for 6/12 USD FRA at 6.50/6.75% i.e. if we buy FRA (borrow) at 6.75%, and sell (deposit) at an implied rate of 8% we would earn the difference as arbitrage gains. To earn 8% for the period of six months starting six month from now, we simply need to borrow today at 5% and deposit the funds at 6.5% for 12 months. As seen above, this process would deliver us a return of 8%. Remember an important aspect of arbitrage that "it is a buy and sell in two different markets undertaken to exploit mispricing". The arbitrageur's investment is 'nil', therefore it is to be ensured that for depositing at T = 0, funds need to be borrowed. We can write the arbitrage procedure in steps. Also refer the diagram given below :

Step 1 : Borrow PV of ₹ 1,00,000 @ 5% for 6 months i.e. ₹ 97,561; Buy GRA for a notional amount of ₹ 1,00,000 @ 6.75%. Buying the FRA locks the borrowing rate at 6.75% for the six months period starting 6 months from now.

Step 2 : Deposit ₹ 97,561 for 12 months @ 6.5% to get ₹ 1,03,902 after 12 months.

(By doing step 1 and 2, the arbitrageur earns 8% for the six months period starting 6 months from now and also is able to borrow at 6.75% for the same period.)
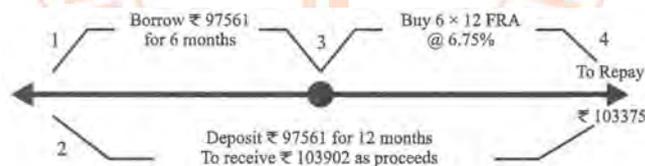
Step 3 : After six months, repay first borrowing (i.e. ₹ 1,00,000 – inclusive of interest) using FRA.

(We actually borrow at the prevailing interest rate, but having bought FRA at 6.75%, we have locked our borrowing at 6.75%, irrespective any prevailing market rate – recollect the concept that we would be paid the difference by the seller of FRA).

Step 4 : At maturity repay second borrowing i.e. to repay ₹ 1,00,000 × (1 + 0.0675/2) = ₹ 1,03,375

The difference between step 2 and step 4 is the arbitrage profit = ₹ 527.

Q. 21. (a) A US based transport company has decided to take a 3-year floating rate loan of US $ 500 million to finance its acquisition. The loan is indexed to 6 month US $ LIBOR with a spread of 75 basis points. The company has identified the following caps and floors quoted by a Bank :

Particulars	Cap		Floor	
Term	3-years	3-years	3-years	3-years
Underlying interest rate	6 month US $ LIBOR	6 month US $ LIBOR	6 month US $ LIBOR	6 month US $ LIBOR
Strike rate	3.0%	3.75%	3.25%	3.75%
Premium	2.0%	1.5%	1.25%	2.0%
Face value	US $ 500 million	US $ 500 million	US $ 500 million	US $ 500 million

You are requested to show how the company can hedge its interest rate exposure by using an interest rate collar strategy. Also calculate the effective cost of the loan showing all the relevant cash flows if the 6 month US $ LIBOR at the 6 reset dates turn out to be : 3.85%, 4.10%, 3.50%, 3.30%, 3.10% and 3.00%.

(Use a discount rate of 4% to amortize the premium).

(b) List and briefly explain the main functions of an investment bank.

Answer 21. (a)

The company should go for interest rate collar i.e. it should buy the cap at a higher strike rate and sell the floor at the lower strike rate. Therefore, the company should buy cap at the strike rate of 3.75% and sell floor at the strike rate of 3.25%.

Net premium outflow = (1.5% – 1.25%) of $ 500 million = $ 12,50,000

Amortization of premium = $\dfrac{\$12,50,000}{\text{PVIFA (2.00\%, 6)}} = \dfrac{12,50,000}{5.6014} = \$ 2,23,157$

Time	LIBOR (%)	Interest rate applicable to loan (%)	Cash flow on loan	Amortization of premium	Cash flow from Cap	Cash flow from floor	Net cash flow
0	-	-	+500,000,000	-	-	-	+500,000,000
1	3.85	4.60	-11,500,000	-223,157	+250,000	-	-11,473,157
2	4.10	4.85	-12,125,000	-223,157	+875,000	-	-11,473,157
3	3.50	4.25	-10,625,000	-223,157	-	-	-10,848,157
4	3.30	4.05	-10,125,000	-223,157	-	-	-10,348,157
5	3.10	3.85	-9,625,000	-223,157	-	-375,000	-10,223,157
6	3.00	3.75	-(9,375,000 + 500,000,000)	-223,157	-	-625,000	510,223,157

Effective cost 'r' is given by the following equation :

500,000,000 = 11,473,157 PVIF (r,1) + 11,473,157 PVIF (r,2) + 10,848,157 PVIF (r,3) + 10,348,157 PVIF (r,4) + 10,223,157 PVIF (r,5) + 510,223,157 PVIF (r,6).

At r = 2%, L.H.S. = 504,381,382

At r = 3%, L.H.S. = 477,197,789

Applying interpolation, $\dfrac{3 - 2}{3 - x} = \dfrac{477,197,789 - 504,381,382}{477,197,789 - 500,000,000} = 2.16\%$ (approx)

Annualized rate = $(1.0216)^2 - 1 = 4.37\%$.

Answer 21. (b)

IPO : Investment Banks helps the Companies in issuing in the primary market to raise capital. They also play the role of merchant bankers or lead bankers to an issue.

Financial Advice : They provide financial advice to investors and serve them by assisting in managing portfolio.

M&A : Investment Banks also help companies to identify, evaluate target companies for mergers and acquisition. They also actively participate in the M&A process.

Credit Risk Analysis : They also analysis the market and credit risk the traders are taking while conducting their daily trades.

Q. 22. (a) Explain the main features in the preparation of project report distinguishing between viability, feasibility, escalation and overrun aspects.

(b) Following are the estimates of the net cash flows and probability of a new project of M/s. Anand Ltd. –

Particulars	Year	P = 0.3	P = 0.5	P = 0.2
Initial investment	0	4,00,000	4,00,000	4,00,000
Estimated net after tax cash inflows per year	1 to 5	1,00,000	1,10,000	1,20,000
Estimated salvage value (after tax)	5	20,000	50,000	60,000

Required rate of return from the project is 10%. Find –

  I. The expected NPV of the project.

  II. The best case and the worst case NPVs.

  III. The probability of occurrence of the worst case, if the cash flows are –

    i. Perfectly dependent overtime

    ii. Independent overtime

  IV. Standard deviation and coefficient of variation assuming that there are only three streams of cash flow, which are represented by each column of the table with the given probabilities.

  V. Coefficient of variation of Anand Ltd., on its average project which is in the range of 0.95 to 1.0, If the coefficient of variation of the project is found to be less riskier than average, 100 basis points are deducted from the Company's cost of capital.

Should the project be accepted by Anand Ltd.?

Answer 22. (a)

Definition : Project Report or Feasibility Report is a written account of various activities to be undertaken by a Firm and their technical, financial, commercial and social viabilities.

Purpose : Project Report states as to what business is intended to be undertaken by the entrepreneur and whether it would be technically possible, financially viable, commercially profitability and socially desirable to do such a business.

Features of a Project Report :

Technical Feasibility : This includes analysis about the technical requirements of the industry in relation to the project in hand and involves a examination of issues like suitability of plant location, adoption of appropriate technology, selection of machinery and plant etc.

Economic, Financial and Commercial Viability :

Economic Viability is concerned with a thorough analysis of present and future market prospects for the proposed product and involves the study of possible competitors in the market and the firm's relative cost advantages and disadvantages in relation to them.

Financial Viability includes estimation of capital requirements and its cost, computation of operating costs, forecasting of sales revenue, arrangement of credit, measurement of profit, finding out the break-even points, assessment of fixed and variable costs, cash flow estimates etc.

Commercial Viability includes the estimation of the selling problems and profitability of the project. A project must, therefore, be economically, financially and commercially viable.

Social Viability :

• Business entities depend heavily on specialized Financial Institutions, funded or approved by Government, for procuring finance, Government or its agencies would extend assistance to a business unit only if the proposed project is socially desirable.

• Social viability becomes necessary for performing the social responsibilities of the Firm. Therefore, at the time of preparing the project report, the social benefits of the project must be analysed well.

Answer 22. (b)

(I) Computation of Net Present Value

Particulars	Years	Disc. Factor @10%	Prob. = 0.3		Prob. = 0.5		Prob. = 0.2	
			CF	DCF	CF	DCF	CF	DCF
After tax inflows	1-5	3.791	1,00,000	3,79,100	1,10,000	4,17,010	1,20,000	4,54,920
Salvage value	5	0.621	20,000	12,420	50,000	31,050	60,000	37,260
Present value of inflows				3,91,520		4,48,060		4,92,180
Less : Investment cost				4,00,000		4,00,000		4,00,000
Net present value				(8,480)		48,060		92,180

Expected NPV = [0.30 – ₹ 8,480] + [0.50 × ₹ 48,060] + [0.20 × ₹ 92,180]

= – 2,544 + 24,030 + 18,436 = ₹ 39,922

(II) Best case NPV   = ₹ 92,180

Worst case NPV   = (₹ 8,480)

(III) Probability of worst case NPV

Nature	Value	Reasoning
Perfectly dependent overtime	0.30	The revenue streams are decided in the first year itself i.e. such revenue streams will follow in the subsequent periods. Therefore, probability of first year's revenue stream is the probability of worst case NPV.
Independent overtime	0.3^5 = 0.00243	Each year's revenue stream carries an independent probability. Therefore, the worst case NPV is the cumulative probability of worst scenarios.

(IV) Standard deviation and Co-efficient of variation

NPV estimate (N)	Probability (P)	Expected NPV	Deviation from expected NPV (D)	Square of deviation [D²]	Variance [P × D²] [₹ 000's]
(1)	(2)	(3) = (1) × (2)	(4) = (1) – Σ (3)	(5) [₹ 000's]	(6) = (2) × (5)
(8,480)	0.3	(2,544)	(48,402)	2,342.75	702.83
48,060	0.5	24,030	8,138	66.23	33.12
92,180	0.2	18,436	52,258	2,730.90	546.18
Expected NPV		39,922			1,282.13

Standard deviation = $\sqrt{P \times D^2}$ = $\sqrt{1282.13}$ = ₹ 35,810

Co-efficient of variation = Standard deviation ÷ Expected NPV = ₹ 35,810 ÷ ₹ 39,922 = 0.90

Computation of Net Present Value at risk adjusted cost of capital

Computation of NPV

Particulars Value	
Present cost of capital	10.00
Less : Premium for lower coefficient of variance [Co-efficient of variance of 0.90 is less than average co-efficient of variation of 0.95. Therefore, 1% or 100 Basis Points is deducted from the cost of capital, as this project is less riskier than company's average risk factor in other projects.	1.00
Risk adjusted cost of capital	9.00

Computation of Net Present Value

Particulars	Years	Disc. Factor @9%	Prob. = 0.3		Prob. = 0.5		Prob. = 0.02	
			CF	DCF	CF	DCF	CF	DCF
After tax inflows	1-5	3.890	1,00,000	3,89,000	1,10,000	4,27,900	1,20,000	4,66,800
Salvage value	5	0.650	20,000	13,000	50,000	32,500	60,000	39,000
Present value of inflows				4,02,000		4,60,400		5,05,800
Less : Investment cost				4,00,000		4,00,000		4,00,000
Net present value				2,000		60,400		1,05,800

Expected NPV = [0.30 × ₹ 2,000] + [0.50 × ₹ 60,400] + [0.20 × ₹ 1,05,800]

= 600 + 30,200 + 21,160 = ₹ 51,960

Recommendation : The project has a positive NPV of ₹ 51,960 on an investment of ₹ 4,00,000. Therefore, the project should be accepted.

Q. 23. Subhash is interested in purchasing a European call option on RCL Ltd. a non-dividend paying stock, with a strike price of ₹ 100 and two years until expiration. RCL Ltd. is currently trading at ₹ 100 per share and the annual variance of its continuously compounded rate of return is 0.01. The Treasury bill that matures in two years, yield a continuously compounded interest rate of 5% per annum.

    (i) Use the Black Scholes Model to calculate the price of the call option that Subhash is interested in buying?

    (ii) What does the put call parity imply about the price of the put, with the strike price of ₹ 100 and two years until expiration?

Given the Normal Distribution Values (V) as follows :

0 to X	One tail
N (0.49) = 0.1879	N (0.49) = 0.3121
N (0.21) = 0.0832	N (0.21) = 0.4168
- X to + X	- ∞ to X
N (0.49) = 0.3758	N (0.49) = 0.6879
N (0.21) = 0.1664	N (0.21) =0.5832

Answer 23.

(i) The Black Scholes formula calculates the price of a call option to be :

    C   = $S\,N(d1) - X\,e^{-rT}\,N(d2)$

Where,

|		
C	=	Price of the call option = ?
S	=	Price of the underlying stock = 100
X	=	Option exercise price = 100
r	=	Risk-free interest rate = 5%
T	=	Current time until expiration = 2 years
N ()	=	Area under the normal curve
d1	=	$[\ln(S/X) + (r + \sigma^2/2)\,T]/\sigma\,T^{\frac{1}{2}}$
d2	=	$d1 - \sigma\,T^{\frac{1}{2}}$

Substituting the given values we first find N (d1) and N(d2) get as follows :

$$d1 = \frac{\ln\left(\frac{100}{100}\right) + [0.05 + \frac{1}{2}(0.04)]\,2.0}{0.2\sqrt{2.0}} = 0.4950$$

d2 = d1 - $\sigma\,T^{\frac{1}{2}}$ = 0.2122

The values of N (d1) and N(d2) – can be calculated depending on what type of Normal Distribution table is given to us. Note that we need the value to the left of the point.

Type 1 : 0 to X Table – We add 0.5 to the table value	Normal Distribution Pattern
N(d1) = N(0.4950) = 0.1879 + 0.5 = 0.6879 N (d2) = N(0.2122) = 0.0832 + 0.5 = 0.5832	
Type 2 : One tail table – We subtract the table value from 1. N(d1) = N(0.4950) = 1 − 0.3121 = 0.6879 N(d2) = N(0.2122) = 1 − 0.4168 = 0.5832	
Type 3 : X to + X table – We divide the table value by 2 and add 0.5. N(d1) = N(0.4950) = 0.3758/2 + 0.5 = 0.6879 N(d2) = N(0.2122) = 0.1664/2 + 0.5 = 0.5832	
Type 4 : - ∞ to X table – We take the table value as it is. N(d1) = N(0.4950) = 0.6879 N(d2) = N(0.2122) = 0.5832	
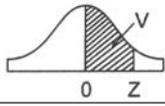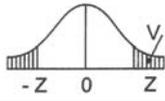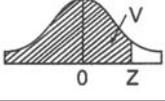
According to the Black-Scholes formula, the price of a European call option (C) on a non-dividend paying common stock is :

C = S N(d1) – X e^{-rT} N(d2)

Value of option = 100 × 0.6879 – 100 × $e^{-(0.05 \times 2)}$ × 0.5832 = ₹ 16.13

The Black Scholes Price of the call option is ₹ 16.13

(ii) Put-Call Parity implies that the cost of a European call option (C) must equal the cost of a European put option with the same strike price and time to expiration (P) plus the current stock price (S) minus the present value of the strike price [PV(X)].

In this problem :
C = ₹ 16.13; S = ₹ 100; PV(X) = ₹ 100 x $e^{-(0.05*2)}$ = ₹ 90.48

Rearranging the Put-Call Parity formula :
P   = C – S + PV(X)
    = ₹ 16.13 – ₹ 100 + ₹ 90.48
    = ₹ 6.61

Therefore, Put-Call Parity implies that the Black-Scholes price of a European put option with a strike price of ₹ 100 and 2 years until expiration should be ₹ 6.61.

Q. 24. Hi-Performance CD Ltd. manufactures high-tech CDs. After two years of operation, it is planning to expand its operations to meet the increased demand for CDs. The current level of production is 7,00,000 packs of 50 CDs. The budgeted level of production after expansion is 12,00,000 packs annually. The CEO of Hi-Performance CD Ltd., wants the CFO, to submit a report relating to the projected working capital requirement due to expansion. The cost and price data for the current level of production and the budgeted level of production are summarized as below :

Pre-expansion Cost and Price Data of one CD Pack of 50 CDs

Raw materials :	₹	₹	₹
Optical storage media (₹ 2 × 50)		100	
Packing material		5	105
Direct labour			55
Overheads :			
Manufacturing (excluding depreciation)			
Fixed	40		
Variable	70	110	
Administration		45	
Selling and distribution			
Fixed	15		
Variable	20	35	
Depreciation		60	250
Total cost per CD pack			410
Excise duty (4% of cost of production) (₹ 410 – ₹ 35)			15
Profit margin			75
Selling price			500
Sales tax (10% of selling price)			50
Invoice price to customers			550

Additional information :

- Current level of production, 7,00,000 packs annually.

- Raw materials for optical storage media are purchased on 2 months credit from suppliers.

- Packing materials are purchased on 1 month credit.

- Average time-lag in payment of overheads, 1 month.

- Average time-lag in payment of wages, 2 weeks

- Time-lag in payment of sales tax is 1.5 months

- Production process on an average, 15 days (2 weeks). Full unit of raw materials is required in the beginning of manufacturing process.

- Sales on 3 months credit.

- Stock of raw materials and finished goods equal 2 weeks requirements.

- Safety margin, 15 per cent.

- Time-lag in payment (collection) of sales, 6 weeks.

- Minimum desired cash balance, ₹ 50,00,000.

Post-expansion Cost and Price per pack of 50 CDs

Raw materials :	₹	₹	₹
Optical storage media (₹ 2 × 50)		100	
Packing material		5	105
Direct labour			55
Overheads :			
Manufacturing (excluding depreciation)			
Fixed	32.50		
Variable	70.00	102.50	
Administrative		26.25	
Selling and distribution			
Fixed	10.42		
Variable	20.00	30.42	
Depreciation		60.00	219.17
Total cost per CD pack			379.17
Excise duty (4% of cost of production i.e. ₹ 348.75)			13.95
Profit margin			106.88
Selling price			500
Sales tax (10% of selling price)			50
Invoice price to customers			550

Additional information :

- **Budgeted level of production : 12,00,000 packs annually**
- **Additional manufacturing overhead, ₹ 1,10,00,000**
- **Additional sales promotion expenses, ₹ 20 lakhs**
- **Additional desired cash balance, ₹ 20 lakh**

The CFO asks the GM, Finance, to assess the working capital requirement before and after the proposed expansion with his comments for submission to the CEO for further necessary action in this matter.

Answer 24.

Assessment of Pre-expansion Working Capital Requirement   ₹

Current assets :		
Raw materials (7,00,000 units × ₹ 105 × 1/24)		30,62,500
Work in process :		
Raw materials* (7,00,000 × ₹ 100 x 1/24)	29,16,667	
Direct labour (7,00,000 x ₹ 55 × 1/24) × 0.5	8,02,083	
Overheads (7,00,000 × ₹ 110 × 1/24) × 0.5	16,04,167	53,22,917
Stock of finished goods (7,00,000 × ₹ 270 × 1/24)		78,75,000
Debtors :		
Cost of goods sold (7,00,000 × ₹ 330 × 3/12)	5,77,50,000	

Less : Depreciation (7,00,000 x ₹ 60 x 3/12)	1,05,00,000	
Administrative expenses (7,00,000 x ₹ 45 x 3/12)	78,75,000	
Selling and distribution expenses (7,00,000 x ₹ 35 x 3/12)	61,25,000	
Sales tax (7,00,000 x ₹ 50 x 3/12)	87,50,000	
Excise duty (7,00,000 x0.04 x ₹ 375 x 3/12)	26,25,000	7,26,25,000
Cash balance		50,00,000
Total		9,38,85,417
Current liabilities :		
Creditors for materials (7,00,000 x ₹ 100 x 2/12)		1,16,66,667
Creditors for packing material (7,00,000 x ₹ 5 x 1/12)		2,91,667
Expenses :		
Wages (7,00,000 x ₹ 55 x 1/24)	16,04,167	
Overheads (7,00,000 x ₹ 190 x 1/12)	1,10,83,333	
Sales tax (7,00,000 x ₹ 50 x 3/24)	43,75,000	1,70,62,500
Total		2,90,20,834
Net working capital		6,48,64,583
Working capital required (NWC x 1.15)		7,45,94,270

*Excluding packing material

Assessment of Post-expansion Working Capital Requirement   ₹

Current assets :		
Raw materials (12,00,000 units x ₹ 105 x 1/24)		52,50,000
Work in process :		
Raw materials* (12,00,000 x ₹ 100 x 1/24)	50,00,000	
Direct labour (12,00,000 x ₹ 55 x 1/24) x0.5	13,75,000	
Overheads (12,00,000 x ₹ 102.50 x 1/24) x0.5	25,62,500	89,37,500
Stock of finished goods (12,00,000 x ₹ 262.50 x 1/24)		1,31,25,000
Debtors :		
Cost of goods sold (12,00,000 x ₹ 322.50 x 3/12)	9,67,50,000	
Less : Depreciation (12,00,000 x ₹ 60 x 3/12)	1,80,00,000	
Administrative expenses (12,00,000 x ₹ 26.25 x 3/12)	78,75,000	
Selling and distribution expenses (12,00,000 x ₹ 30.42@ x 3/12)	91,26,000	
Sales tax (12,00,000 x ₹ 50 x 3/12)	1,50,00,000	
Excise duty (12,00,000 x 0.04 x ₹ 348.75 x 3/12)	41,85,000	11,49,36,000
Cash required		70,00,000
Total		14,92,48,500
Current liabilities :		
Creditors for materials (12,00,000 x ₹ 100 x 2/12)		2,00,00,000
Creditors for packing material (12,00,000 x ₹ 5 x 1/12)		5,00,000

Expenses :		
Wages (12,00,000 × ₹ 55 × 1/24)	27,50,000	
Overheads (12,00,000 × ₹ 159.17 × 1/12)	1,59,17,000	
Sales tax (12,00,000 × ₹ 50 × $\frac{3}{24}$)	75,00,000	2,61,67,000
Total		4,66,67,000
Net working capital		10,25,81,500
Working capital required (NWC × 1.15)		11,79,68,725

* Excluding packing matrial

@ ₹ 20 per unit + (Existing ₹ 105 lakh + Additional ₹ 20 lakh) ÷ 12,00,000

Comment : The working capital requirement would increase by ₹ 4,33,74,455 (₹ 11,79,68,725 - ₹ 7,45,94,270) due to expansion of production capacity.

Q. 25. **On 01.04.2012, Melodious Musicals and Entertainment concluded a contract for purchase of 1,00,000 CDs from an American Company at $ 1.48 per CD, to be supplied over the next 3 months. Melodious Musicals are required to make the payment immediately upon receipt of all the CDs.**

To meet the obligation, Melodious Musicals had booked a Forward Contract with its bankers to buy USD 3 months hence. The following are the Exchange Rates on 01.04.2012 –

Spot	**₹ 41.30 – 70**
1-months Forward	**₹ 42.00 – 50**

On 01.07.2012, the American Company expressed its inability to supply the last installment of 3,00,000 CDs due to export restrictions in US, and requests Melodious Musicals to settle for the quantity supplied. Spot rate of 01.07.2012 was ₹ 40.90 – 41.20.

 (i) Ascertain the total cash outgo for Melodious for purchase of 7,00,000 CDs.

(ii) Would total cash outgo undergo any change if the American Company had informed on 01.06.2012, when the following exchange rates were available.

Spot	**₹ 41.70 – 42.20**
1-months Forward	**₹ 42.10 – 42.50**

Answer 25.

Cash flow will be on two counts –

    a. Purchase of USD for settling supply of 7,00,00 units of CDs.

    b. Cancellation of Forward Contract to the extent of purchase price of 3,00,000 units.

American Company informs on 01.07.2012

Particulars		Amount
Amount to be paid for supply of 7,00,000 units		
Purchase cost of 7,00,000 CDs	[7,00,000 × USD 1.48 per CD]	USD 10,36,000
Rupee outflow for purchase of USD 10,36,000	[USD 10,36,000 × Forward Ask Rate of 42.50] [A]	₹ 4,40,30,000
(Cost)/Gain on cancellation of Forward Contract on due date [See Note]		
Purchase cost of 3,00,000 CDs	[3,00,000 × USD 1.48 per CD]	USD 4,44,000

Amount payable under Forward Contract for USD 4,44,000 at 3-month Forward Ask Rate of ₹ 42.50		₹ 1,88,70,000
Less : Amount receivable on selling USD 4,44,000 at Spot Bid Rate of ₹ 40.90 for cancellation		₹ 1,81,59,600
(Cost)/ (Gain) on Cancellation	[B]	₹ 7,10,400
Total Cash Outflow for purchase of 7,00,000 units of CDs	[A + B]	₹ 4,47,40,400

Note : Sequence of Action if Forward Contract is cancelled on the due date –

- Original deal (Buy Contract) should be cancelled.
- **Sell Spot :** Therefore, Melodious Musicals should sell USD 4,44,000 at the Spot Bid Rate ₹ 40.10 for cancellation of original contract on 01.07.2012.
- **Settlement of Difference :** Net difference between the original 3-month Forward Buy Contract and Spot Sale Contract should be settled i.e.
  - USD 4,44,000 × (3-months Forward Buy Rate (Ask Rate) as on 01.04.2012 Less Spot Bid Rate as on 01.07.2012)
  - ₹ 7,10,400 [i.e. ₹ 4,44,000 × (42.50 – 40.90)] to be PAID to Banker.

American Company informs on 01.06.2012

Particulars		Amount
Amount to be paid for supply of 7,00,000 units (as above)	**[A]**	₹ 4,40,30,000
(Cost)/Gain on cancellation of Forward Contract on 01.06.2012 [See Note]		
Purchase cost of 3,00,000 CDs [3,00,000 × USD 1.48 per CD]		USD 4,44,000
Amount payable under Forward Contract for USD 4,44,000 at 3-month Forward Ask Rate of ₹ 42.50		₹ 1,88,70,000
Less : Amount receivable on selling USD 4,44,000 at 1-month Forward Bid Rate of ₹ 42.10 for cancellation as on 01.06.2012		₹ 1,86,92,400
(Cost)/ (Gain) on Cancellation	**[B]**	₹ 1,77,600
Total Cash Outflow for purchase of 7,00,000 units of CDs	**[A + B]**	₹ 4,42,07,600

Note : Sequence of Action if Forward Contract is cancelled before the due date –

- Original deal (Buy Contract) should be cancelled.
- Sell Forward : Therefore, Melodious Musicals should enter into a 1-month Forward Contract for sale of USD 4,44,000 at the ₹ 42.10 for reversal of original contract.
- Settlement of Difference : Net difference between the original Contract and the new Contract should be settled i.e.
  - USD 4,44,000 × (3-months Forward Buy Rate (Ask Rate) as on 01.04.2012 ₹ 42.50 Less 1-month Forward Sell Rate (Bid Rate) as on 01.06.2012 ₹ 42.10)
  - ₹ 1,77,600 to be PAID to Banker.

Q. 26. (a) Mazboot Cement Ltd. requires you, as their financial consultant, to advise them with respect to the dividend policy they have to follow for the current year. The cement industry has been through a very trying period in the last five years and the constraints on operations have been removed in the early part of the year. The company hopes to improve its position in the years to

come and has plans to put an additional plant in the neighbourhood of the present factory. The increased profits, due to expansion in capacity, are expected to be 25% of the additional capital investment after meeting interest charges but before depreciation on the additional plant installed. The shares of Mazboot Cement Ltd. are widely held and there is a large majority of holdings in the hands of middle class investors whose average holding do not exceed 500 shares. The following further data is also made available to you :

Particulars	Last 5 yrs.					Current yr.
	1	2	3	4	5	6
Earnings per share (₹)	6.00	5.00	4.50	4.50	4.00	17.50
Cash availability/share (₹)	7.50	6.00	5.00	4.00	4.00	20.00
Dividend/share (₹)	3.00	3.00	3.00	2.00	Nil	?
Pay out ratio	50	60	67	45	-	?
Average market price (face value of ₹ 100)	80	70	70	70	60	140
P/E ratio	13.33:1	14:1	15.6:1	15.6:1	15:1	8:1

What recommendations would you make ? Give reasons for your answers.

(b) The investment manager of a large Indian software company receives the following quotes from its foreign exchange broker.

US dollar spot rate : ₹ 47.75/ US $

US dollar option quotation

Strike price	Call			Put		
	June	September	December	June	September	December
45.0000	3.0	-	-	-	-	-
45.5000	2.6	2.9	-	-	-	-
46.0000	2.0	2.3	2.45	0.2	-	-
46.5000	1.85	1.95	2.15	0.25	-	-
47.0000	1.25	1.85	2.00	0.70	0.90	-
47.5000	0.85	1.15	1.45	1.00	1.25	1.75
48.0000	0.50	0.74	0.89	1.59	1.92	2.50
48.5000	0.30	0.52	0.68	1.70	2.20	-
49.0000	0.15	-	-	1.90	-	-
49.5000	0.10	-	-	2.00	-	-
50.0000	0.08	-	-	2.30	-	-

What calculation will the investment manager make for following questions?

 (i) What is the intrinsic value for the September 47.50 call option?

(ii) What is the intrinsic value for the June 46 put option?

(iii) What is the break-even exchange rate for the December 46.5 call and the December 48 put?

(iv) If the December spot rate is expected to be ₹ 48.50/US $, which call option should be bought?

 (v) The software company will receive its export income in December and the expected spot rate (in December) will be ₹ 46.5/US $, which put option should be bought?

Answer 26. (a)

The company appears to be following a stable dividend policy, that is, a policy of maintaining a stable rupee dividend, decreasing it only when it appears that earnings have reached a new, permanently low level or vice-versa in that although the EPS has declined from ₹ 6 in Year 1 to ₹ 4.50 in Year 3, no corresponding decrease was effected in DPS. However, when the declining trend of earnings continued in subsequent years too, the dividends had been lowered inasmuch as no dividends were paid in year 5. Consequently, its share prices fell from ₹ 80 in Year 1 to ₹ 60 in Year 5. The decline in market prices is less pronounced in the context of much distressing profitability and dividend record of the company during the period as a whole. The rate of return of 6% on equity capital in year 1 was the maximum. Even this modest amount consistently declined to eventually a very low figure of 4% by current year; the dividend yield was still smaller. The only off-setting factor was the stable dividend policy.

Given the improved record of earnings in the current year and the trend which is likely to continue in future years, coupled with favourable liquidity position, a rise in dividend is commended for the under mentioned reasons.

  (i) The investors would receive dividend income free of tax, especially if this category of investors includes retired persons who need the current income for living expenses and do not wish to sell even a small portion of their shares either because of transaction costs involved or because they are reluctant to 'eating their own capital.

 (ii) The investors must be expecting a substantial rise in dividend in the light of the current market price of ₹ 140 compared to ₹ 60 last year. Failure to pay dividend commensurate to the shareholder's expectation will have an adverse effect on share prices.

(iii) Cement industry with stable sales and earnings can afford high leverage ratios. The company is not likely to encounter any major difficulty in raising funds to finance an additional plant due to bright future prospects.

 (iv) The payment of dividend resolves uncertainty; investors in general are risk averters; they prefer current dividends to larger deferred dividends.

The payment was 50% in year 1; the payment of 60% is recommended this year, assuming that target dividend payout ratio is 75%. Moreover, the company through advertisements should make the investors aware of the growth prospects and the investment opportunities ahead which would have a positive effect on share prices.

Answer 26. (b)

Intrinsic value of an option is the amount by which the option is in-the-money.

For a call option, intrinsic value = Maximum [(Spot rate – Strike rate), 0]

For a put option, intrinsic value = Maximum [(Strike rate – Spot rate), 0]

  (i) Intrinsic value for the September 47.5 call option
     = Max [(₹ 47.75/US $ - ₹ 47.5/US $), 0] = Max [₹ 0.25/US $, 0] = ₹ 0.25/US $

 (ii) Intrinsic value for the June 46 put option
     = Max [(₹ 46/US $ - ₹ 47.75/US $), 0] = Max [-(₹ 1.75/US $, 0] = 0

(iii) The break-even exchange rate for the December 46.5 call on settlement date is Re X/US $
     So, the premium paid   = ₹ 2.15/US $
     Profit from the call option = ₹ (X – 46.5)/US $
     At break even, ₹ (X – 46.5)/US $ = ₹ 2.15/US $
     X = ₹ 48.65/US $

The break-even exchange rate for December 48 put is :

Premium paid = ₹ 2.50/US $

Profit from the put option   = ₹ (48 – X)/US $

At break-even, ₹ (48-X)/US $ = ₹ 2.50/US $

X = ₹ 45.5/US $

(iv) For an expected spot rate of ₹ 48.50/US $, we need to find out profit from buying the December call option at various strike prices.

Gain from call option = Max [(Settlement rate – Strike rate), 0] – Premium

= Value of option at expiration – Premium

₹

Option	Strike price	Premium (A)	Option value at expiration (B)	Gain/Loss [B – A]
December call	46.00/US $	2.45/US $	2.50/US $	0.05/US $
December call	46.50/US $	2.15/US $	2.00/US $	-0.15/US $
December call	47.00/US $	2.00/US $	1.50/US $	-0.50/US $
December call	47.50/US $	1.45/ US $	1.00/US $	-0.45/US $
December call	48.00/US $	0.89/US $	0.50/US $	-0.39/US $
December call	48.50/US $	0.68/US $	0.00/US $	-0.68/US $

So, for the expected December spot price of ₹ 48.50/US $, the December call option of strike price ₹ 46.00/US $ should be bought.

(v) Gain from purchasing the December put option of various strikes, for which quotes are available, for an expiration price of ₹ 46.50/US $.

Option	Strike price	Premium (A)	Option value at expiration (B)	Gain/Loss [B – A]
December put	47.50/US $	1.75/US $	1.00/US $	-0.75/US $
December put	48.00/US $	2.50/US $	1.50/US $	-1.00/US $

As no gains accrue by purchasing the different December put available for the expected December expiration rate of ₹ 46.50/US $, the software company should not hedge through the put options.

Q. 27. (a) What are currency futures? List the steps involved in the technique of hedging through futures.

(b) The following quotes are available for 3-months options in respect of a share currently traded at ₹ 31 :

Strike price ₹ 30;   Call option ₹ 3;   Put option ₹ 2

An investor devises a strategy of buying a call and selling the share and a put option. What is his profit/loss profile if it is given that the rate of interest is 10% per annum? What should be the position if the strategy adopted is selling a call and buying the put and the share?

Answer 27. (a)

A currency futures contract is a derivative financial instrument that acts as a conduct to transfer risks attributable to volatility in prices of currencies. It is a contractual agreement between a buyer and a seller for the purchase and sale of a particular currency at a specific future date at a predetermined price. A futures contract involves an obligation on both parties to fulfil the terms of the contract. A futures contract can be bought or sold only with reference to the USD.

There are six steps involved in the technique of hedging through futures :

   (i) Estimating the target income (with reference to the spot rate available on a given date.)

  (ii) Deciding on whether Futures Contracts should be bought or sold.

 (iii) Determining the number of contracts (since contract size is standardised).

 (iv) Identifying profit or loss on target outcome.

  (v) Closing out futures position and

 (vi) Evaluating profit or loss on futures.

Answer 27. (b)

According to put-call parity, $S + P = C + PV(X)$

Substituting the given data we can say that :

LHS = $31 + 2 = ₹ 33$, RHS = $3 + 30/(1 + 0.10/4) = ₹ 32.27$

Since LHS > RHS, we have an arbitrage opportunity, as we can see a difference of ₹ 0.73.

In the given problem the investor is devising a strategy of buying a call and selling the share and a put option. From the put call parity equation we can see that, it is equivalent to :

$$C - S - P = -PV(X)$$

Or, $[C - S - P] + [PV(X)] = 0$

	Arbitrage Profits per share		
Position	Immediate cash flow	Pay off in 3 months	
		$S_t \leq 30$	$S_t > 30$
Short stock	+ 31.00	$-S_t$	$- S_t$
Deposit PV(30) = 29.27	- 29.27	30	30
Buy call	- 3.00	0	$S_t - 30$
Sell put	+ 2.00	$- (30 - S_t)$	0
Total	= ₹ 0.73/share	0	0

(S_t = Stock price at expiration)

This strategy would be adopted, since the initial payoff is positive.

Similar strategy if developed by selling a call and buying the share and put as follows, would result in a net initial outflow: From Put Call Parity equation it is equivalent to :

$$- C + S + P = PV(X)$$

Or, $(- C + S + P) - [PV(X)]$

	Arbitrage Profits per share		
Position	Immediate cash flow	Pay off in 3 months	
		$S_t \leq 30$	$S_t > 30$
Buy stock	- 31.00	S_t	S_t
Borrow PV(30) = 29.27	+ 29.27	-30	-30
Sell call	+ 3.00	0	$-(S_t - 30)$
Buy put	-2.00	$(30 - S_t)$	0
Total	= - ₹ 0.73/share	0	0

(S_t = Stock price at expiration)

This strategy would not be adopted, since the initial payoff is negative.

Q. 28. **From the following particulars, you are required to prepare the Balance Sheet of a Company.**

₹

Fixed assets (After writing off 30%)	10,50,000
Fixed assets turnover ratio (On cost of sales)	2
Finished goods turnover ratio (on cost of sales)	6
GP rate on sales	25%
Net profit (before interest) to sales	8%
Fixed charges cover (debenture interest 7%)	8
Debt collection period	1.5 month
Material consumed to sales	30%
Stock of raw materials (in terms of months consumption)	3
Current ratio	2.4
Quick ratio	1.0
Reserves to capital ratio	0.21

Answer 28.

Working notes :

(i) Calculation of cost of sales

Fixed assets turnover ratio = 2 (given)

$\dfrac{\text{Cost of Sales}}{\text{Fixed Assets}}$ = 2

$\dfrac{\text{Cost of Sales}}{₹\,10,50,000}$ = 2

Cost of Sales   = 2 × 10,50,000 = ₹ 21,00,000

(ii) Calculation of value of finished goods

Finished Goods turnover ratio = 6 (given)

$\dfrac{\text{Cost of Sales}}{\text{Finished Goods}}$ = 6

$\dfrac{₹\,21,00,000}{\text{Finished Goods}}$ = 6

6 × Finished goods   = 21,00,000

Finished goods   = 21,00,000/6 = ₹ 3,50,000

(iii) Calculation of sales and gross profit

Gross profit ratio   = 25% (given)

$\dfrac{\text{Gross profit}}{\text{Sales}} \times 100$ = 25%

If Cost of sales i.e. ₹ 21,00,000 is 75%

Sales value would be 100%

$$= 21,00,000 \times 100/75 \qquad = ₹ 28,00,000$$

Gross profit $\qquad = ₹ 28,00,000 - ₹ 21,00,000 = ₹ 7,00,000$

(iv) Calculation of net profit $= 28,00,000 \times 8/100 = ₹ 2,24,000$

(v) Calculation of interest charges

Interest service coverage ratio $= 8$ (given)

$$\frac{\text{Net profit before interest}}{\text{Interest}} = 8$$

$$\frac{2,24,000}{\text{Interest}} = 8$$

$8 \times$ interest $\qquad = 2,24,000$

Interest $\qquad = 2,24,000/8 = ₹ 28,000$

(vi) Calculation of value of 7% debentures

Interest on debentures @ 7% $= ₹ 28,000$

Debentures $\qquad = 28,000 \times 100/7 = ₹ 4,00,000$

(vii) Calculation of debtors

Debt collection period $\qquad = 1.5$ months (given)

$$\frac{\text{Debtors}}{₹ 28,00,000} \times 12 = 1.5$$

$12 \times$ Debtors $\qquad = 1.5 \times 28,00,000$

Debtors $\qquad = 42,00,000/12 = ₹ 3,50,000$

(viii) Calculation of material consumption

Material consumption $= 30\%$ of sales (given)

$$= 28,00,000 \times 30/100 = ₹ 8,40,000$$

(ix) Raw material stock

Raw material stock $= 3$ months of materials consumption (given)

$$= 8,40,000 \times 3/12 = ₹ 2,10,000$$

(x) Calculation of current assets and current liabilities

Current ratio $\qquad = 2.4$ (given)

$$\frac{\text{Current assets}}{\text{Current liabilities}} = 2.4 \text{ times}$$

Quick ratio $\qquad = 1.0$ (given)

$$\frac{\text{Liquid assets}}{\text{Current liabilities}} = 1$$

∴ Value of stock   = 2.4 – 1.0 = 1.4

Value of stock   = Finished goods + Raw materials

= 3,50,000 + 2,10,000

1.4   = ₹ 5,60,000

If 1.4 time is 5,60,000

1 time - ?

= ₹ 4,00,000

Current liabilities   = ₹ 4,00,000

Current assets (4,00,000 × 2.4) = ₹ 9,60,000

(xi) Calculation of cash

Current assets – Stock of finished goods and raw materials and debtors

9,60,000 – (3,50,000 + 2,10,000 + 3,50,000) = ₹ 50,000

(xii) Calculation of capital reserves

Ratio of reserves to capital = 0.21 (given)

If capital is   = 1.00

Reserve   0.21

Net worth   1.21

Net worth   = ₹ 12,10,000

Capital   = 12,10,000 × 100/12.1

= ₹ 10,00,000

Reserves   = 12,10,000 × 0.21/1.21 = ₹ 2,10,000

Balance Sheet as on.................

Liabilities	₹	Assets	₹
Capital	10,00,000	Fixed assets	10,50,000
Reserves	2,10,000	Current assets	
Debentures 7%	4,00,000	Debtors	3,50,000
Current liabilities	4,00,000	Stock (3,50,000 + 2,10,000)	5,60,000
		Cash	50,000
	20,10,000		20,10,000

Q. 29. **The financial position of the A Company Ltd. As on 31ˢᵗ March 2012 and 31ˢᵗ March, 2011 and the Profit and Loss Account for the year on 31ˢᵗ March 2012 are as follows :**

₹

Particulars	*2012*	*2011*
Assets		
Land and buildings	1,50,000	1,00,000
Plant and machinery	2,20,000	2,00,000
Less : Accumulated depreciation	82,000	80,000
Inventory	1,25,000	90,000
Debtors	40,000	45,000
Cash	70,000	50,000
	5,23,000	4,05,000
Liabilities		
Share capital	1,75,000	75,000
Share premium	12,500	7,500
Reserves and surplus	62,500	17,500
Institutional loan	23,000	15,000
Debentures	1,20,000	1,50,000
Creditors	25,000	30,000
Salaries payable	15,000	10,000
Provisions for tax	50,000	60,000
Provision for dividend	40,000	40,000
	5,23,000	4,05,000

Profit and Loss Account for the year ended 31ˢᵗ March 2012

₹

Sales		5,00,000
Less : Cost of goods sold		2,10,000
Gross profit		2,90,000
Less : Operating expenses :		
Office and administrative	45,000	
Selling and distribution	25,000	
Interest	12,000	
Depreciation	22,000	1,04,000
Operating profit		1,86,000
Add : Gain on sale of plant		6,000
Total profit		1,92,000
Less : Income-tax		87,000
Net profit		1,05,000

The additional information is given below :

  (i) **During the year, plant costing ₹ 50,000 (accumulated depreciation of ₹ 20,000) was sold.**

 (ii) **The debentures of the face value of ₹ 30,000 were converted into share capital at par.**

(iii) **The company paid a dividend of ₹ 40,000 and issued bonus shares of ₹ 20,000 during the year.**

(iv) **The company further issued 5,000 shares of ₹ 10 each at a premium of Re. 1 per share during the year.**

You are required to prepare a Statement of Sources and Application of Funds.

Answer 29.

Working notes :

Profit and Loss Adjustment A/c.

Particulars	₹	Particulars	₹
To Depreciation	22,000	By Balance b/d	17,500
To Dividend	40,000	By Plant and machinery A/c.	6,000
To Bonus Shares	20,000	(profit on sale)	
To Balance c/d	62,500	By Fund from operations	
		(balancing figure)	1,21,000
	1,44,500		1,44,500

Plant and Machinery A/c.

Particulars	₹	Particulars	₹
To Balance b/d	2,00,000	By Bank A/c. (sale)	36,000
To Profit & Loss A/c. (profit on sale)	6,000	By Provision for depreciation A/c.	20,000
To Bank A/c. (balancing figure)	70,000	By Balance c/d.	2,20,000
	2,76,000		2,76,000

Provision for Depreciation on Plant and Machinery A/c.

Particulars	₹	Particulars	₹
To Plant & Machinery A/c.	20,000	By Balance b/d	80,000
To Balance c/d	82,000	By Profit and Loss A/c.	22,000
	1,02,000		1,02,000

Schedule showing changes in Working Capital   ₹

Particulars	2011	2012	Increase	Decrease
Current assets				
Cash	50,000	70,000	20,000	-
Debtors	45,000	40,000	-	5,000
Inventory	90,000	1,25,000	35,000	-
(a)	1,85,000	2,35,000		

Current liabilities					
Creditors		30,000	25,000	5,000	-
Salaries payable		10,000	15,000	-	5,000
Provision for tax		60,000	50,000	10,000	-
Provision for dividend		40,000	40,000	-	-
	(b)	1,40,000	1,30,000	-	-
Working capital	(a) – (b)	45,000	1,05,000	-	-
Increase in working capital		60,000	-	-	60,000
		1,05,000	1,05,000	70,000	70,000

Funds flow statement for the year ended 31st March, 2012   ₹

Sources of funds	
Funds from operations	1,21,000
Sale of plant	36,000
Institutional loan raised	8,000
Issue of shares	55,000
	2,20,000
Application of funds	
Purchase of land and buildings	50,000
Purchase of plant and machinery	70,000
Payment of dividend	40,000
Increase in working capital	60,000
	2,20,000

Q. 30. A firm has an investment proposal, requiring an outlay of ₹ 80,000. The proposal is expected to have two years economic life with no salvage value. In year 1, there is a 0.4 probability that cash inflow after tax will be ₹ 50,000 and 0.6 probability that cash inflow after tax will be ₹ 60,000. The probability assigned to cash inflow after tax for the year 2 are as follows :

Cash inflow year 1	₹ 50,000		₹ 60,000	
Cash inflow year 2	Cash flow (₹)	Probability	Cash flow (₹)	Probability
	24,000	0.2	40,000	0.4
	32,000	0.3	50,000	0.5
	44,000	0.5	60,000	0.1

The firm uses a 10% discount rate for this investment.

Required :

(i) Construct a Decision Tree for the proposed investment project and calculate the expected Net Present Value (NPV).

(ii) What Net Present Value will the project yield, if worst outcome is released? What is the probability of occurrence of this NPV?

(iii) What will be the Best NPV and the probability of that occurrence?

(iv) Will the project be accepted?

Answer 30.

Year 0 (1)	Year 1 (2)	Year 2 (3)	Joint Probl. (4)	NPV (5) = (3) + (2) − (1)	Prob. of NPV (6) = (4) × (5)
		CF 24,000	**0.08**	**(14,726)**	(1,178)
	Prob. 0.20	DCF 19,824	0.4 × 0.2	[45,450 + 19,824 − 80,000]	[0.08 × (14,726)]
	CF 50,000 Prob. 0.30	CF 32,000	**0.12**	**(8,118)**	(974)
	DCF 45,450	DCF 26,432	0.4 × 0.3	[45,450 + 26,432 − 80,000]	[0.12 × (8,118)]
Prob. 0.40	Prob. 0.50	CF 44,000	**0.20**	**1,794**	359
		DCF 36,344	0.4 × 0.5	[45,450 + 36,344 − 80,000]	[0.20 × (1,794)]
Cash Outlay ₹ 80,000		CF 40,000	**0.24**	**7,580**	1,819
	Prob. 0.40	DCF 33,040	0.6 × 0.4	[54,540 + 33,040 − 80,000]	[0.24 × (7,580)]
Prob. 0.60	CF 60,000 Prob. 0.50	CF 50,000	**0.30**	**15,840**	4,752
	DCF 54,540	DCF 41,300	0.6 × 0.5	[54,540 + 41,300 − 80,000]	[0.30 × (15,840)]
	Prob. 0.10	CF 60,000	**0.06**	**24,100**	1,446
		DCF 49,560	0.6 × 0.1	[54,540 + 49,560 − 80,000]	[0.06 × (24,100)]
Time 0	Time 1	Time 2			
PVF 1.000	PVF 0.909	PVF 0.826		**Mean NPV**	**6,224**

Conclusions :

Expected Net Present Value	₹ 6,224
Worst Case NPV	(₹ 14,726). Probability 0.08 or 8%
Best Case NPV	₹ 15,840. Probability 0.30 or 30%
Action on project	Accept as the Mean NPV or the Expected NPV is positive.