

FINAL EXAMINATION

(REVISED SYLLABUS - 2008)

GROUP - III

Paper-12 : FINANCIAL MANAGEMENT & INTERNATIONAL FINANCE

Q1. Write short notes on :

- (a) Foreign Currency Convertible Bonds(FCCBs)**
- (b) External Commercial Borrowings(ECBs)**
- (c) Depository Receipts (DRs)**
- (d) Commercial Papers (CPs)**

Answer 1.

- (a) The FCCB means bonds issued in accordance with the relevant scheme and subscribed by a non-resident in foreign currency and convertible into ordinary shares of the issuing company in any manner, either in whole or in part, on the basis of any equity related warrants attached to debt instruments. The FCCBs are unsecured, carry a fixed rate of interest and an option for conversion into a fixed number of equity shares of the issuer company. Interest and redemption price (if conversion option is not exercised) is payable in dollars. Interest rates are very low by Indian domestic standards. FCCBs are denominated in any freely convertible foreign currency.

FCCBs have been popular with issuers. Local debt markets can be restrictive in nature with comparatively short maturities and high interest rates. On the other hand, straight equity-issue may cause a dilution in earnings, and certainly a dilution in control, which many shareholders, especially major family shareholders, would find unacceptable. Thus, the low coupon security which defers shareholders dilution for several years can be alternative to an issuer. Foreign investors also prefer FCCBs because of the Dollar denominated servicing, the conversion option and the arbitrage opportunities presented by conversion of the FCCBs into equity at a discount on prevailing Indian market price.
- (b) Indian promoters can also borrow directly from foreign institutions, foreign development bank, World Bank, etc. It is also known as Foreign Currency Term loans. Foreign institutions provide foreign currency loans and financial assistance towards import of plants and equipments. The interest on these loans is payable in foreign currency. On the payment date, interest amount is converted into domestic currency at the prevailing foreign exchange rate. The borrowings, repayment and interest payments can be tailor-made in view of the cash flow position of the project.
- (c) A DR means any instrument in the form of a depository receipt or certificate created by the Overseas Depository Bank outside India and issued to the non-resident investors against the issue of ordinary shares. A Depository Receipt is a negotiable instrument evidencing a fixed

number of equity shares of the issuing company generally denominated in US dollars. DRs are commonly used by those companies which sell their securities in international market and expand their shareholdings abroad. These securities are listed and traded in International Stock Exchanges. These can be either American Depositary Receipt (ADR) or Global Depositary Receipt (GDR). ADRs are issued in case the funds are raised through retail market in United States. In case of GDR issue, the invitation to participate in the issue cannot be extended to retail US investors. As the DRs are issued in overseas capital markets, the funds to the issuer are available in foreign currency, generally in US \$.

- (d) Commercial Paper (CP) is an unsecured promissory note issued by a firm to raise funds for a short period, generally, varying from a few days to a few months. For example, in India, the maturity period of CP varies between 15 days to 1 year while in some other countries, the maturity period may go up to 270 days. It is a money market instrument and generally purchased by commercial banks, money market mutual funds and other financial institutions desirous to invest their funds for a short period. As the CP is unsecured, the firms having good credit rating can only issue the CP.

The firm or the dealers in CP sell these to the short-term lenders who use it as interest earning investment of temporary surplus of operating funds. The nature of these surpluses and motives for buying the CP suggest that all the holders of the CP expect to be paid in full at maturity. The maturity term of CP is not generally extended. This expectation on the part of short-term lenders requires that the borrowing firm must be (i) an established and profitable firm, and (2) consistently maintaining a credit goodwill in the market and having good credit rating. The interest cost of the CP depends upon the amount involved, maturity period and the prime lending rates of commercial banks. The main advantage of CP is that the cost involved is lower than the prime lending rates. In addition to this cost, the borrowing firm has to bear another cost in the form of placement fees payable to the dealer of CP who arranges the sale.

Q2. (a) Discuss the role of the Finance Manager

(b) Discuss the factors to be considered for determining an appropriate Dividend Policy.

Answer 2.

(a) Role of the Finance Manager

The traditional role of the finance manager is to confine to the raising of funds in order to meet operating requirements of the business. This traditional approach has been criticized by modern scholars on the following grounds. It was prevalent till the mid-1950s.

1. The traditional approach of raising funds alone is too narrow and thus it is outsider-looking-in approach.
2. It viewed finance as a staff specialty.
3. It has little concern how the funds are utilized.
4. It over-emphasized episodic events and non-recurring problems like the securities and its markets, incorporation, merger, consolidation, reorganization, recapitalization and liquidation etc.
5. It ignores the importance of working capital management.
6. It concentrated on corporate finance only and ignored the financial problems of sole trader and partnership firms.

7. Traditional approach concentrated on the problems of long-term financing and ignored the problems of short-term financing.

There was a change from traditional approach to the modern concept of finance function since the mid-1950s. The industrialization, technological innovations and inventions and a change in economic and environment factors since the mid-1950s necessitated the efficient and effective utilization of financial resources. Since then, finance has been viewed as an integral part of the management. The finance manager is, therefore, concerned with all financial activities of planning, raising, allocating and controlling the funds in an efficient manner. In addition, profit planning is another important function of the finance manager. This can be done by decision making in respect of the following areas :

1. Investment Decisions for obtaining maximum profitability after taking the time value of the money into account.
 2. Financing decisions through a balanced capital structure of Debt-Equity ratio, sources of finance, EBIT/EPS computations and interest coverage ratio etc.
 3. Dividend decisions, issue of Bonus Shares and retention of profits with objective of maximization of market value of the equity share.
 4. Best utilization of fixed assets.
 5. Efficient working capital management (inventory, debtors, cash marketable securities and current liabilities).
 6. Taking the cost of capital, risk, return and control aspects into account.
 7. Tax administration and tax planning.
 8. Pricing, volume of output, product-mix and cost-volume-profit analysis (CVP Analysis).
 9. Cost control.
 10. Stock Market-Analyse the trends in the stock market and their impact on the price of Company's share and share buy-back.
- (b) A firm takes into account the following consideration to determine the appropriate dividend policy :
- (i) **Investment opportunities** : Firms, which have substantial investment opportunities generally, tend to maintain low pay out ratio, to conserve resources for growth. On the other hand, firms, which have limited avenues, often usually permit more generous payout ratio.
 - (ii) **Liquidity** : A firm takes into account the following consideration to determine the appropriate dividend policy:
 - (iii) **Investment opportunities** : Firms, which have substantial investment opportunities generally, tend to maintain low pay out ratio, to conserve resources for growth. On the other hand, firms, which have limited avenues, often usually permit more generous payout ratio.
 - (iv) **Liquidity** : Payment of dividend is largely dictated by the amount of cash available. Certainly this is 'what M & M suggest should be the case. On the other hand, if failure to pay the dividend is interrupted adversely by the capital market, the best interest of the shareholder's wealth might be advanced by making sure that cash is available for payment of dividend, by borrowing or by passing up otherwise beneficial investment opportunities.
 - (v) **Control** : External financing unless through rights issue, lead to dilution of control. Thus, if major holders are averse to dilution of control, the company tends to rely more on retained earnings and maintain low payout ratio.

- (vi) **Clientele effect** : The clientele effect shows that a company's dividend policy may depend on the "preferred habits" of the majority shareholders. If the dividend policy of a company is not consistent with the preferences of majority shareholders many investors would want to dispose off their holdings in the company, causing the market price of shares to fall.
- (vii) **Information content of dividends** : Some believe that, the level of dividends and particularly the changes in the level of dividends conveys new information to the world. An increased level of dividend might be a signal that the management views the future with confidence. A shareholder might interpret large dividend also as the failure of management to find new investment opportunities for future expansion. This is definitely contrary to what the management wishes the interpretation to be.

Payment of dividend is largely dictated by the amount of cash available. Certainly this is 'what M & M suggest should be the case. On the other hand, if failure to pay the dividend is interrupted adversely by the capital market, the best interest of the shareholder's wealth might be advanced by making sure that cash is available for payment of dividend, by borrowing or by passing up otherwise beneficial investment opportunities.

Q3. Write short notes on :

- (a) Arbitrate Process
- (b) Problems in Determining Cost of capital
- (c) Capital Rationing
- (d) Factoring and Forfaiting

Answer 3.

(a) Arbitrage Process:

According to M – M, two firms identical in all respects except their capital structure, cannot have different market values or different cost of capital. In case, these firms have different market values, the arbitrage will take place and equilibrium in market values is restored in no time. Arbitrage process refers to switching of investment from one firm to another. When market values are different, the investors will try to take advantage of it by selling their securities with high market price and buying the securities with low market price. The use of debt by the investors is known as personal leverage or home made leverage.

Because of this arbitrage process, the market price of securities in higher valued market will come down and the market price of securities in the lower valued market will go up, and this switching process is continued until the equilibrium is established in the market values. So, M – M, argue that there is no possibility of different market values for identical firms.

(b) Problems in determining Cost of Capital:

- i) Conceptual controversy regarding the relationship between cost of capital and capital structure is a big problem.
- ii) Controversy regarding the relevance or otherwise of historic costs or future costs in decision making process.
- iii) Re-computation of cost of equity capital depends upon the expected rate of return by its investors. But the quantification of expectations of equity shareholders is a very difficult task.

- iv) Retained earnings has the opportunity cost of dividends forgone by the shareholders. Since different shareholders may have different opportunities for reinvesting dividends, it is very difficult to compute cost of retained earnings.
- v) Whether to use book value or market value weights in determining weighted average cost of capital poses another problem.

(c) Capital Rationing : Capital rationing is a situation where a constraint or budget ceiling is placed on the total size of capital expenditures during a particular period. Often firms draw up their capital budget under the assumption that the availability of financial resources is limited.

Capital rationing refers to a situation where a company cannot undertake all positive NPV projects it has identified because of shortage of capital. Under this situation, a decision maker is compelled to reject some of the viable projects having positive net present value because of shortage of funds. It is known as a situation involving capital rationing.

Factors Leading to Capital Rationing: Two different types of capital rationing situation can be identified, distinguished by the source of the capital expenditure constraint.

I. External Factors: Capital rationing may arise due to external factors like imperfections of capital market or deficiencies in market information which might have for the availability of capital. Generally, either the capital market itself or the Government will not supply unlimited amounts of investment capital to a company, even though the company has identified investment opportunities which would be able to produce the required return. Because of these imperfections the firm may not get necessary amount of capital funds to carry out all the profitable projects.

II. Internal Factors: Capital rationing is also caused by internal factors which are as follows :

- Reluctance to take resort to financing by external equities in order to avoid assumption of further risk
- Reluctance to broaden the equity share base for fear of losing control.
- Reluctance to accept some viable projects because of its inability to manage the firm in the scale of operation resulting from inclusion of all the viable projects.

Situations of Capital Rationing :

Situation I: Projects are divisible and constraint is a single period one:

The following are the steps to be adopted for solving the problem under this situation:

- a. Calculate the profitability index of each project
- b. Rank the projects on the basis of the profitability index calculated in (a) above.
- c. Choose the optimal combination of the projects.

Situation II: Projects are indivisible and constraint is a single period one

The following steps to be followed for solving the problem under this situation:

- a. Construct a table showing the feasible combinations of the project (whose aggregate of initial outlay does not exceed the fund available for investment).
- b. Choose the combination whose aggregate NPV is maximum and consider it as the optimal project mix.

(d) Factoring & Forfeiting

Both factoring and forfeiting are used as tools of financing. But there are some differences:

1. Factoring is always used as a tool for short term financing whereas forfeiting is for medium term financing at a fixed rate of interest.
2. Factoring is generally employed to finance both the domestic and export business. But, forfeiting is invariably employed in export business only.
3. The central theme of factoring is the purchase of the invoice of the client whereas it is only the purchase of the export bill under forfeiting.
4. Factoring is much broader in the sense it includes the administration of the sales ledger, assumption of credit risk, recovery of debts and rendering of consultancy services. On the other hand, forfeiting mainly concentrates on financing aspects only and that too in respect of a particular export bill.
5. Under factoring, the client is able to get only 80% of the total invoice as 'credit facility' whereas the 100% of the value of the export bill (of course deducting service charges) is given as credit under forfeiting.
6. Forfeiting is done without recourse to the client whereas it may or may not be so under factoring.
7. The bills under forfeiting may be held by the forfaitor till the due date or they can be sold in the secondary market or to any investor for cash. Such a possibility does not exist under factoring.
8. Forfeiting is a specific one in the sense that it is based on a single export bill arising out of an individual transaction only. But factoring is based on the "whole turnover" i.e., a bulk finance is provided against a number of unpaid invoices.

Q4.

- (a) The government is proposing to sell a 5-years bond of Rs 1,000 at 8 per cent rate of interest per annum. The bond amount will be amortised equally over its life. If an investor has a minimum required rate of return of 7 per cent, what is the bond's present value for him?**

In this illustration, the amount of interest will go on reducing because the outstanding amount of bond will be decreasing due to amortisation. The amount of interest for five year will be: Rs 1,000 × .08 = Rs 80 for the first year; (Rs 1,000 – Rs 200) × .08 = Rs 64 for the second year; (Rs 800 – Rs 200) × .08 = Rs 48 for the third year, (Rs 600 – Rs 200) × .08 = Rs 32 for the fourth year and (Rs 400 – Rs 200) × .08 = Rs 16 for the fifth year. The outstanding amount of bond would be zero at the end of fifth year.

Since the government will have to return Rs 200 every year, the outflows every year will be Rs 200 + Rs 80 = Rs 280; Rs 200 + Rs 64 = Rs 264; Rs 200 + Rs 48 = Rs 248; Rs 200 + Rs 32 = Rs 232; and Rs 200 + Rs 16 = Rs 216 respectively from first through five years. Referring to the present value table at the end of the book, the value of the bond is calculated as follows :

$$\begin{aligned}
 B_0 &= \frac{280}{(1.07)^1} + \frac{264}{(1.07)^2} + \frac{248}{(1.07)^3} + \frac{232}{(1.07)^4} + \frac{216}{(1.07)^5} \\
 &= 280 \times .935 + 264 \times .873 + 248 \times .816 + 232 \times .763 + 216 \times .713 \\
 &= \text{Rs } 261.80 + \text{Rs } 230.47 + \text{Rs } 202.37 + \text{Rs } 177.02 + \text{Rs } 154.00 \\
 &= \text{Rs } 1025.66.
 \end{aligned}$$

- (b) Suppose that a company's expected dividend now is Rs 3.48 per share. Its dividends are expected to grow at 15 per cent for six years and then at a rate of 8 per cent indefinitely. The capitalisation rate is 12 per cent. What is the price of the share today? The calculation of the price of the share today is shown below :

- (i) Present value of the share during supernormal growth periods:

$$P_0 = \sum_{t=1}^6 \frac{DIV_0 (1 + g_n)^t}{(1 + k_e)^t}$$

$$P_0 = \frac{3.48 (1.15)}{(1.12)} + \frac{3.48 (1.15)^2}{(1.12)^2} + \frac{3.48 (1.15)^3}{(1.12)^3} + \frac{3.48 (1.15)^4}{(1.12)^4} + \frac{3.48 (1.15)^5}{(1.12)^5} + \frac{3.48 (1.15)^6}{(1.12)^6}$$

$$= 4 \times .893 + 4.60 \times .797 + 5.29 \times .712 + 6.08 \times .636 + 7.00 \times .567 + 8.04 \times .507 = \text{Rs. } 22.93$$

- (ii) Present value of the share at the end of year 6, growth being 8 per cent :

$$(a) P_6 = \frac{DIV_7}{k_e - g_n} = \frac{8.04 (1.08)}{.12 - .08} = \text{Rs } 217$$

- (c) (i) Calculate the present value of Rs 600 (a) received one year from now; (b) received at the end to five years; (c) received at the end of fifteen years. Assume a 5 per cent time preference rate.

- (ii) Determine the present value of Rs 700 each paid at the end of each of the next six years.

Assume a 8 per cent of interest.

- (iii) Assume a 10 per cent discount rate. Compute the present value of Rs 1,100; Rs 900; Rs 1,500 and Rs 700 received at the end of one through four years. For calculations, use the tables given at the end of the book.

Solution :

- (i) Table C will be used to compute the present value.

(a) The present value factor at 5 per cent for one year is: 0.952. Therefore, the present value of Rs 600 at the end of one year will be :

$$\text{Rs } 600 \times .952 = \text{Rs } 571.20.$$

(b) The present value factor at 5 per cent at the end of five years is : 0.784. Therefore, present value of Rs 600 will be: $\text{Rs } 600 \times .784 = \text{Rs } 470.40.$

- (c) The present value factor at 5 per cent at the end of fifteen years is 0.481. Therefore, present value of Rs 600 will be : $\text{Rs } 600 \times .481 = \text{Rs } 288.60.$

(ii) As the present value of an annuity of Rs 700 has to be computed, Table D will be used. The present value factor of an annuity of Re 1 at 8 per cent for 6 years is 4.623. Therefore, the present value of an annuity of Rs 700 will be: $4.623 \times \text{Rs } 700 = \text{Rs } 3,236.10.$

(iii) Table C will be used to compute the present value of the uneven series of cash flows. The computation is shown as follows :

$$\begin{aligned} P &= \text{Rs } 1,100 \times .909 + \text{Rs } 900 \times .826 + \text{Rs } 1,500 \times .751 \\ &\quad + \text{Rs } 700 \times .683 \\ &= \text{Rs } 999.90 + \text{Rs } 743.40 + \text{Rs } 1,126.50 + \text{Rs } 478.10 \\ &= \text{Rs } 3,347.90 \end{aligned}$$

Q5. The following information has been extracted from the Balance Sheet of ABC Ltd. as on 31st December —

Component of capital	Equity Share Capital	12% Debentures	18% Term Loan	Total
Amount Rs. In Lakhs	400	400	1,200	2,000

1. Determine the WACC of the Company. It had been paying dividends at a consistent rate of 20% per annum.
2. What difference will it make if the current price of the Rs. 100 share is Rs. 160?
3. Determine the effect of Income Tax on WACC under both the above situations.
(Tax Rate = 40%).

Solution :

1. Computation of WACC (based on Book Value Proportions and ignoring Tax)

Component(a)	Proportion(b)	Individual Cost (c)	Wacc (d) = (b) × (c)
Equity Share Capital	4/20	$K_e = 20\%$ (Dividend Approach)	4.00%
12% Debentures	4/20	$K_d = 12\%$	2.40%
18% Term Loan	12/20	$K_d = 18\%$	10.80%
		WACC = $K_o =$	17.20%

- Note:**
1. $K_e = \text{Dividend per Share} \div \text{Equity Market Price per share} = \text{Rs. } 20.$
 2. Book Value Proportions have been considered in Column (b) above.

2. (a) Computation of WACC (based on Book Value Proportions and ignoring tax)

Component (a)	Proportion (b)	Individual Cost (c)	WACC (d) = (b) × (c)
Equity Share Capital	4/20	$K_e = 20 \div 160 = 12.50\%$	3.57%
12% Debentures	4/20	$K_d = 12\%$	2.40%
18% Term Loan	12/20	$K_d = 18\%$	10.80%
Total Rs. 2,240 Lakhs		WACC = $K_o =$	15.70%

2. (b) Computation of WACC (based on Market Value Proportions and ignoring tax)

Component (a)	Proportion (b)	Individual Cost (c)	WACC (d) = (b) × (c)
Equity Capital Rs. 640 Lakhs	64/224	$K_e = 20 \div 160 = 12.50\%$	3.57%
12% Debentures Rs. 400 Lakhs	40/224	$K_d = 12\%$	2.14%
18% Term Loan Rs. 1,200 Lakhs	120/224	$K_d = 18\%$	9.64%
Total Rs. 2,240 Lakhs		WACC = $K_o =$	15.35%

3. Effect of Tax Rate of 35% on WACC**(a) Computation of WACC with tax (Situation 1 above based on Book Value Proportions)**

Component (a)	Proportion (b)	Individual Cost (c)	WACC (d) = (b) × (c)
Equity Share Capital	4/20	$K_e = 20\%$	4.00%
12% Debentures	4/20	$K_d = 12\% \times 60\% = 7.20\%$	1.44%
18% Term Loan	12/20	$K_d = 18\% \times 60\% = 10.80\%$	6.48%
WACC = K_0 =			11.92%

The WACC has reduced from **17.20%** to **11.92%**, due to tax saving effect.

(b) Computation of WACC with tax (Situation 2 (a) above based on Book Value Proportions)

Component (a)	Proportion (b)	Individual Cost (c)	WACC (d) = (b) × (c)
Equity Share Capital	4/20	$K_e = 20 \div 160 = 12.50\%$	2.50%
12% Debentures	4/20	$K_d = 12\% \times 60\% = 7.20\%$	1.44%
18% Term Loan	12/20	$K_d = 18\% \times 60\% = 10.80\%$	6.48%
WACC = K_0 =			10.42%³

The WACC has reduced from **15.70%** to **10.42**, due to tax saving effect.

(c) Computation of WACC with tax (Situation 2(b) above based on Book Value Proportions)

Component (a)	Proportion (b)	Individual Cost (c)	WACC (d) = (b) × (c)
Equity Capital Rs. 640 Lakhs	64/224	$K_e = 20 \div 160 = 12.50\%$	3.57%
12% Debentures Rs. 400 Lakhs	40/224	$K_d = 12\% \times 60\% = 7.20\%$	1.29%
18% Term Loan Rs. 1,200 Lakhs	120/224	$K_d = 18\% \times 60\% = 10.80\%$	5.780%
Total Rs. 2,240 Lakhs		WACC = K_0 =	10.64%

The WACC has reduced from **15.35%** to **10.64%**, due to tax saving effect.

Q6. (a) The required rate of return of investors is 15%. ABC Ltd. declared and paid annual dividend of Rs. 4 per share. It is expected to grow @ 20% for the next 2 years and 10% thereafter. Compute the price at which the shares should sell.

Note : P.V. factor @ 15% for Year 1 = 0.8696 and Year 2 = 0.7561.

D_0 = Dividend declared and paid i.e. 15% (Rs. 4 per share)

G = Growth rate (20% for next 2 years and 10% thereafter)

Calculation of Dividend and Share

$$\begin{aligned}
 D_1 &= D_0 (1+g) = 4 (1+0.20) &&= \text{Rs. 4.80} \\
 D_2 &= D_1 (1+g) = 4.80 (1+0.20) &&= \text{Rs. 5.76} \\
 D_3 &= D_2 (1+g) = 5.76 (1+0.10) &&= \text{Rs. 6.34}
 \end{aligned}$$

Present value of dividends for the first 2 years

$$= (4.80 \times 0.8696) + (5.76 \times 0.7561) = 4.174 + 4.355 = \text{Rs. } 8.53$$

Price of Stock (P_2)

$$P_2 = \frac{D_3}{r - g} = \frac{6.34}{0.15 - 0.10} = \frac{6.34}{0.05} = \text{Rs. } 126.80$$

$$\text{P.V. of Stock} = 126.80 \times 0.7561 = \text{Rs. } 95.87$$

$$\text{Value of stock} = 8.53 + 95.87 = \text{Rs. } 104.40$$

- (b) E. Ltd. is considering the replacement of a machine used exclusively for the manufacture of one of its Product Y. The existing machine has a book value of Rs. 65,000 after deducting straight line depreciation from historical costs, however, it could be sold only for Rs. 45,000. The new machine would cost Rs. 1,00,000. E. Ltd. expects to sell Product Y for four more years. The existing machine could be kept in operation for that period of time if it were economically desirable to do so. After four years, the scrap value of both the existing machine and the new machine would be zero.

The current costs per unit for manufacturing Y on the existing and new machine are as follows :

(Rs.)

	Existing Machine		New Machine
Materials	22.00		20.00
Labour (32 hours @ Rs. 1.25)	40.00	(16 hours @ Rs. 1.25)	20.00
Overheads (32 hours @ Rs. 0.60)	19.20	(16 hours @ Rs. 1.80)	28.80
Total cost	81.20		68.80

Overheads are allocated to products on the labour hour rate method. The hourly rates of 0.60 and 1.80 comprise 0.25 and 0.625 for variable overheads and 0.35 and Rs. 1.175 for fixed overheads, including depreciation.

Current sales of Y are 1000 units per annum at Rs. 90 each, if the new machine were purchased, output would be increased to 1200 units and selling price would be reduced to Rs. 80.

E. Ltd. requires a minimum rate of return on investment of 20 per cent per annum in money terms. Material cost, overheads and selling prices are expected to increase at the rate of 15% per annum, in line with the index of retail prices. Labour costs are expected to increase at the rate of 20% per annum. You are required to :—

- Give calculations to show whether purchase of the new machine would be worthwhile.
- Comment on the treatment of inflation and the estimation of 20% money cost of capital.

$$(i) \text{ Cost of replacement} = 1,00,000 - 45,000 = \text{Rs. } 55,000$$

Manufacturing cost

Fixed items, including depreciation, should be disregarded on the assumption :

- Fixed costs do not change as a result of the new machine.
- Additional 200 units of extra production would be sold.
- All variable elements in the costs given represent cash flows (i.e., labour, material and variable overhead).

Operating cash flow Comparison

(Rs.)

Particulars	New Machine (1200 units)		Existing Machine (1000 units)		Incremental
	P.U.	Total	P.U.	Total	Cash flow
Sales	80	96,000	90	90,000	6,000
Materials	20	24,000	22	40,000	(2,000)
Labour	20	24,000	40	40,000	16,000
Overheads	10	12,000	8	8,000	(4,000)
Next cash flows		36,000		20,000	16,000

Operating savings are Rs. 16,000 p.a. in favour of new machine.

Notes :

- Current prices are assumed in the above table *i.e.*, prices at time 0.
- Time increase in revenue from new machine Rs. 6,000 is exactly offset by the increases in materials and variable overheads *i.e.* Rs. 6,000. Revenue, materials and variable overheads are stated to be subject to the same rate of inflation *i.e.* 15% and therefore will continue to increase at the same rate.
- The net savings of Rs. 16,000 represent the saving on labour costs which is expected to increase @ 20% p.a.

Q7. (a) The Super Specialists Ltd. constructs customized parts for satellites to be launched by USA and China. The parts are constructed in eight locations (including the central head quarters) around the world. The Finance Director, Mr. Kamni, chooses to implement video conferencing to speed up the budget process and save travel costs. She finds that, in earlier years, the company sent two officers from each location to the central headquarters to discuss the budget twice a year. The average travel cost per person, including air fare, hotels and meals, is Rs. 18,000 per trip. The cost of using video conferencing is Rs. 550,000 to set up a system at each location *plus* Rs. 300 per hour average cost of telephone time to transmit signals. A total 32 hours of transmission time will be needed to complete the budget each year. The company depreciates this type of equipment over five years by using straight line method. An alternative approach is to travel to local rented video conferencing facilities, which can be rented for Rs. 1,500 per hour *plus* Rs. 400 per hour average cost for telephone charges.

You are the Senior Officer Finance Department. You have been asked by Ms. Kamni to evaluate the proposal and suggest if it would be worthwhile for the company to implement video conferencing.

Option I : Cost of travel, in case Video Conferencing facility is not provided

(Rs.)

Total Trip = No. of Locations × No. of Persons × No. of Trips per Person
(7 × 2 × 2 = 28 Trips)

Total Travel Cost (including air fare, hotel accommodation and meals)
(28 trips × Rs. 18,000 per trip)

5,04,000

Option II : Video Conferencing Facility is provided by Installation of

Own Equipment at Different Locations		(Rs.)
Cost of Equipment at S location	(Rs. 5,50,000 × 8 locations)	44,00,000
Economic life of Machines	(5 years)	
Annual depreciation	(44,00,000/5)	8,80,000
Annual transmission cost	(32 hrs. transmission × 8 locations × Rs. 300 per hour)	76,800
Annual cost of operation	(8,80,000 + 76,800)	9,56,800

Option III : Engaging Video Conferencing Facility on Rental Basis (Rs.)

Rental cost	(32 hrs. × 8 location × Rs. 1,500 per hr.)	3,84,000
Telephone cost	(32 hrs. × 8 locations × Rs. 400 per hr.)	1,02,400
Total rental cost of equipment	(3,84,000 + 1,02,400)	4,86,400

Analysis : The annual cash outflow is minimum, if video conferencing facility is engaged on rental basis. Therefore, Option III is suggested.

(b) A company has received 3 proposals for the acquisition of an assets on lease costing Rs. 1,50,000.

Option I : The terms of offer envisaged payment of lease rentals for 96 months. During the first 72 months, the lease rentals were to be paid @ Rs. 30 p.m. per Rs. 1,000 and during the remaining 24 months @ Rs. 5 p.m. per Rs. 1,000. At the expiry of lease period, the lessor has offered to sale the assets at 5% of the original cost.

Option II : Lease agreement for a period of 72 months during which lease rentals to be paid per month per Rs. 1,000 are Rs. 35, Rs. 30, Rs. 26, Rs. 24, Rs. 22 and Rs. 20 for next 6 years. At the end of lease period the asset is proposed to be abandoned.

Option III : Under this offer a lease agreement is proposed to be signed for a period of 60 months wherein a initial lease deposit to the extent of 15% will be made at the time of signing of agreement. Lease rentals @ Rs. 35 per Rs. 1,000 per months will have to be paid for a period of 60 months on the expiry of leasing agreement, the assets shall be sold against the initial deposit and the asset is expected to last for a further period of three years.

You are required to evaluate the proposals keeping in view the following parameters.

- (i) Depreciation @ 25%
- (ii) Discounting rate @ 15%
- (iii) Tax rate applicable @ 40%

The monthly and yearly discounting factors @ 15% discount rate are as follows :

Period	1	2	3	4	5	6	7	8
Monthly	0.923	0.765	0.685	0.590	0.509	0.438	0.377	0.325
Yearly	0.869	0.756	0.658	0.572	0.497	0.432	0.376	0.327

Solution :

Given below are the three tables showing the calculations to decide the best option.

Option I**[Amount in Rs.]**

1	2	3	4	5	6	7	8
Year	Rentals	Monthly Dis. Factor @ 15%	PV of (2)	Tax Shelter (2) × 40%	Annual Disc. Fac- tor @ 15%	PV of (5)	Net Cash Flow (4-7)
1	54000	0.923	49842	21600	0.869	18770	31072
2	54000	0.795	42930	21600	0.756	16330	26600
3	54000	0.685	36990	21600	0.658	14213	22777
4	54000	0.590	31860	21600	0.572	12355	19505
5	54000	0.509	27486	21600	0.497	10735	16751
6	54000	0.438	23652	21600	0.432	9331	14321
7	9000	0.377	3393	3600	0.376	1354	2039
8	9000	0.325	2925	3600	0.327	1177	1748
End	7500	0.327	2452	—			2452
0.327 is Year ending discount factor							137265

Option II**[Amount in Rs.]**

1	2	3	4	5	6	7	8
Year	Rentals	Monthly Dis. Factor @ 15%	PV of (2)	Tax Shelter (2) × 40%	Annual Disc. Fac- tor @ 15%	PV of (5)	Net Cash Flow (4-7)
1	63000	0.923	58149	25200	0.869	21899	36250
2	54000	0.765	42930	21600	0.756	16330	26600
3	46900	0.685	32058	18720	0.658	12318	19740
4	43200	0.590	25488	17280	0.572	9884	15604
5	39600	0.509	20156	15840	0.497	7872	12284
6	36000	0.438	15768	14400	0.432	6221	9547
							120025

Q8. (a)

A stockist of a particular commodity makes a profit of Rs.30 on each sale made within the same week of purchase, otherwise he incurs a loss of Rs. 30 on each item. The data on the past sales are given below :

No. of items sold within	5	6	7	8	9	10	11
Frequency	0	9	12	24	9	6	0

- Find out the optimum number of items the stockist should buy every week in order to maximize the profit.
- Calculate the expected value of perfect information.

Solution :

(i) The payoff table for the given problem

No. of units sold	Freq.	Prob.	No. of units Purchased				
			8	9	10	90	60
6	92	0.15	180	150	120	90	60
7	12	0.20	180	210	180	150	120
8	24	0.40	180	210	240	210	180
9	9	0.15	180	210	240	270	240
10	6	0.10	180	210	240	270	300
60	Expected Pay off	180	201	210	195	171	

Since the expected payoff is maximum (= Rs. 210) when 8 units of the commodity are purchased. Hence, in order to maximise the profit, the stockist should buy 8 units of the item every week

(ii) To find Expected value of Perfect Information, let us first calculate Expected Profit under Perfect Information below :

$$\begin{aligned} \text{EPPI} &= (180 \times 0.15) + (210 \times 0.20) + (240 \times 0.40) + (270 \times 0.15) + (300 \times 0.10) \\ &= 27 + 42 + 96 + 40.50 + 30 = \text{Rs. } 235.50 \end{aligned}$$

$$\begin{aligned} \text{Hence, EVPI} &= \text{Expected Profit under Perfect Information} - \text{Optimum Profit} \\ &= 235.50 - 210 = \text{Rs. } 25.50 \end{aligned}$$

- (b) The globe Manufacturing Company Ltd. is considering an investment in one of the two mutually exclusive proposals. Project X and Y, which require cash outlays of Rs. 3,40,000 and Rs. 3,30,000 respectively. The certainty-equivalent (C.E.) approach is used in incorporating risk in capital budgeting decisions. The current yield on government bond is 8% and this be used as the risk less rate. The expected net cash flows and their certainty-equivalent are as follows :

Year-end	Project X		Project Y	
	Cash flow Rs.	C.E.	Cash flow Rs.	C.E.
1	1,80,000	.8	1,80,000	.9
2	2,00,000	.7	1,80,000	.8
3	2,00,000	.5	2,00,000	.7

Present value factors of Rs. 1 discounted at 8% at the end of year 1, 2 and 3 are .926, .857 and .794 respectively.

Required : (i) Which project should be accepted?; (ii) If risk adjusted discount rate method is used, which project would be analysed with a higher rate?

Solution :**(i) Statement Showing Net Present Value of Project X**

Year end	Cash flow Rs.	C.E.	Adjusted Cash flow Rs.	Present value factor at 8%	Total present value Rs.
	(a)	(b)	(c) = (a) × (b)	(d)	(e) = (c) × (d)
1	1,80,000	0.8	1,44,000	0.926	1,33,344
2	2,00,000	0.7	1,40,000	0.857	1,19,980
3	2,00,000	0.5	1,00,000	0.794	79,400
Less : Initial Investment					3,32,724
Net Present Value					3,40,000 (7.276)

Q9. Rama International is investigating the acquisition of Shivani International Company.**SHIVANI INTERNATIONAL COMPANY****BALANCE SHEET (Rs. crore)**

10% Cumulative preference capital		100
Ordinary share capital (30 crore shares at Rs. 10 per share)		300
Reserves and surplus		150
14% Debentures		80
Current liabilities		<u>100</u>
Total		<u>730</u>
Next fixed assets		275
Investments		50
Current Assets :		
Stock	190	
Book debts	150	
Cash and bank balance	65	<u>405</u>
Total		<u>730</u>

Rama proposed to offer the following to Shivani :

- 10% convertible preference share of Rs. 100 crore in Rama for paying 10% cumulative preference capital of Shivani;
- 12% convertible debentures of Rs. 84 crore in Rama to redeem 14% debentures of Shivani;
- One ordinary share of Rama for every three shares held by Shivani's shareholders, the market price per share being Rs. 42 for Rama's share and Rs. 20 for Shivani's shares.

After acquisition, Rama is expected to dispose off Shivani's stock (inventory) for Rs. 150 crore, book debts for Rs. 102 crore and investments for Rs. 55 crore. It would pay entire current

liabilities. What is the cost of acquisition of Rama? If Rama's required rate of return is 20 per cent how much should be the annual after-tax cash flows from Shivani's acquisition assuming a time horizon of eight years and a zero salvage value? Would your answer change if there is a salvage of Rs. 30 crore after 8 years?

Solution :

(a)	Cost of acquisition		<i>Rs. crore</i>
	10% convertible preference share	100	
	12% convertible debentures	84	
	Ordinary share capital : (30/3) × Rs. 42	420	
	Payment of current liabilities	<u>100</u>	
	Gross payment	704	
	Less : Realization from :		
	Investment	55	
	Stock	150	
	Book debts	102	
	Cash	<u>65</u>	<u>372</u>
	Net Cost		<u>332</u>

- (b) (i) $332 = A \times PVA_{F_{20.8}}$
 $332 = A \times 3.837$
 $A = 332/3.837 = \text{Rs. } 86.53 \text{ crores}$
- (ii) $332 = A \times PVA_{F_{20.8}} + 30 \times PV_{F_{20.8}}$
 $332 = 3.837A + .233 \times 30$
 $332 = 3.837A + 6.99$
 $A = (332 - 6.99)/3.837 = \text{Rs. } 84.70 \text{ crore}$

BP Factors, offers recourse factoring on the following terms :

	Facility	Recourse Factoring
I.	Discount charge (payable up-front)	18% p.a.
II.	Reserve	21%
III.	Commission	2.5%

The Finance Manager of Fame Furnishings Ltd. a dealer in home furnishings has approached BP Factor to factor its receivables. After intricate analysis of the sales documents of Fame Furnishings Ltd. BP Factors offered a guaranteed payment of 45 days.

The following information about the credit policy and trends of Fame Furnishing Ltd is available :

Fame Furnishings sells on terms 2/10 net 45. On an average 50% of the customers pay on the 10th day and avail the discount. Again, on an average the remaining customers pay 80 days after the invoice date. The bad debts and losses amount to 1% of the sales invoices. The sales personnel are responsible for following up collections and by and large the Fame Furnishings can increase its annual sales by Rs. 25 lakhs if the sales people are relieved from collection jobs. The gross margin

on sales is 28% and the estimated sales turnover for the following year without considering the increase in sales is Rs. 300 lakhs. By offloading sales ledger administration and credit monitoring, Fame Furnishings can save overheads to the extent of Rs. 1.50 lakhs per annum. Currently, Fame Furnishings is financing its investments through a mix of bank finance and long-term funds in the ratio of 3:2. The effective rate on bank finance is 17% and the pre-tax cost of long-term funds is 21%.

You are required to :

- Prepare cost-benefit analysis of recourse factoring and advise Fame Furnishings whether to accept the factoring proposal or not.
- Find out the maximum rate of factoring commission Fame Furnishings can pay if it wishes to relieve the cost of bad debts and be indifferent between recourse and non-recourse factoring.

Solution :

- The relevant costs associated with in-house management of receivables and recourse factoring are listed below :

Relevant costs of In-house management of receivables

- | | |
|--|---|
| A. Cash discount | = $300 \times 0.02 \times 0.50$ = Rs. 3.0000 Lakhs |
| Average collection period | = $(10 \times 0.50) + (80 \times 0.50)$ = 45 days |
| Cost of bank finance lakhs | = $(300 \times 3/5) \times (45/360) \times 0.17$ = Rs. 3.8250 |
| Cost of long-term funds lakhs | = $(300 \times 2/5) \times (45/360) \times 0.21$ = Rs. 3.1500 |
| B. Cost of funds in receivables | = Rs. 6.9750 lakhs |
| C. Bad debt losses | = 300×0.01 = Rs. 3 lakhs |
| D. Contribution lost on foregone sales | = 25×0.28 = Rs. 7.0000 lakhs |
| E. Avoidable cost of sales ledger administration & credit monitoring | = Rs. 1.50000 lakhs |

Relevant costs of recourse factoring

- | | |
|-------------------------|--|
| F. Factoring commission | = 325×0.025 = Rs. 8.1250 lakhs |
| G. Discount charge | = $325 \times 0.79 \times 0.18 \times (45/360)$ = Rs. 5.7916 lakhs |

Cost-benefit analysis of recourse factoring

- | | |
|---|-------------------------------------|
| I. Benefit associated with recourse factoring | = A + B + D + E = Rs. 18.4750 lakhs |
| J. Cost associated with recourse factoring | = F + G + H = Rs. 15.6935 lakhs |
| K. Net benefit | = I - J = Rs. 2.7816 lakhs |

As the net benefit associated with recourse factoring, is positive, Fame Furnishings is advised to opt for recourse factoring.

- should be same and as benefit of non-recourse factoring is increased by the amount for bad debt losses i.e. Rs. 3 lakhs, non-recourse factoring commission can be higher than recourse factoring by Rs. 3 lakhs.

$\therefore$ Non-recourse factoring commission = $8.125 + 3$ = Rs. 11.125 lakhs.

Maximum factoring commission, BP Factoring can pay = $11.125/325$ i.e. Rate 3.42%

Q10. RST Ltd. has a capital of Rs. 10,00,000 in equity shares of Rs. 100 each. The shares are currently quoted at par. The company proposes declaration of a dividend of Rs. 10 per share. The capitalisation rate for the risk class to which the company belongs is 12%. What will be the market price of the share at the end of the year, if - (i) no dividend is declared; and (ii) 10% dividend is declared?

Assuming that the company pays the dividend and has net profits of Rs. 5,00,000 and makes new investments of Rs. 10,00,000 during the period, how many new shares must be issued? Use the M.M. Model.

Modigliani and Miller - Dividend Irrelevancy Model :

$$P_0 = \frac{P_1 + D_1}{1 + K_e}$$

Where,

P_0 = Existing market price per share *i.e.* Rs. 100

P_1 = Market price of share at the year end (to be determined)

D_1 = Contemplated dividend per share *i.e.* Rs. 10

K_e = Capitalisation rate for the risk class to which the company belongs *i.e.* 12% or 0.12

(i) Calculation of share price when no dividend is declared

$$P_0 = \frac{P_1 + D_1}{1 + K_e}$$

$$100 = \frac{P_1 + 0}{1 + 0.12}$$

$$P_0 = 100 \times 1.12 = \text{Rs. } 112$$

(ii) Calculation of share price when dividend is declared

$$P_0 = \frac{P_1 + D_1}{1 + K_e}$$

$$100 = \frac{P_1 + 10}{1 + 0.12}$$

$$P_1 + 10 = 100 \times 1.12$$

$$P_1 = 112 - 10 = \text{Rs. } 102$$

(iii) Calculation of no. of shares to be issued

(Rs. lakhs)

Particulars	if dividend declared	if dividend not declared
Net Income	5,00,000	5,00,000
Less : Dividend paid	—	1,00,000
Retained earnings	5,00,000	4,00,000
New investments	10,00,000	10,00,000
Amount to be raised by issues of new shares (i)	5,00,000	6,00,000
Market price per share (ii)	Rs. 112	Rs. 102
No. of new shares to be issued (i)/(ii)	4,464	5,882

Alternatively

No. of shares to be issued can also be calculated by applying the follows formula :

$$DN = \frac{1 - (E - nD_1)}{P_1}$$

Where,

DN = Change in the number of shares outstanding during the period

n = Number of shares outstanding at the beginning of the period *i.e.* 10,000 shares

I = Investment amount required for capital budget *i.e.* Rs. 10,00,00

E = Earning of the firm during the period *i.e.* Rs. 5,00,000

P_1 = Market price of share at the end of period one (i) if no dividend declared – Rs. 112 (ii) if dividend declared – Rs. 102

D_1 = Dividend to be received at the end of period one *i.e.* Rs. 10

(i) If no dividend is declared

$$\begin{aligned} DN &= \frac{10,00,000 - (5,00,000 - 10,000 \times 0)}{112} \\ &= \frac{10,00,000 - 5,00,000}{112} = \frac{5,00,000}{112} = 4,464 \text{ shares} \end{aligned}$$

(ii) If no dividends is declared

$$\begin{aligned} DN &= \frac{10,00,000 - (5,00,000 - 10,000 \times 10)}{102} \\ &= \frac{10,00,000 - 4,00,000}{102} = \frac{6,00,000}{102} = 5,882 \text{ shares} \end{aligned}$$

Verification of M.M. Dividend Irrelevancy theory

(Rs. lakhs)

Particulars	If dividend not declared	If dividend declared
Existing shares	10,000	10,000
New shares	4,464	5,882
Total No. of shares at the year end (i)	14,464	15,882
Market price per share (ii)	Rs. 112	Rs. 102
Total market value of shares at the end of year (i) × (ii)	Rs. 16,20,00	16,20,000

Analysis : The market value of shares at the end of year will remain the same whether dividends are distributed or not declared.

Q11. XYZ Ltd. sells its products on a gross profit of 20% of sales. The following information is extracted from its annual accounts for the year ending 31st December, 1999.

Sales (at 3 months credit)	Rs. 40,00,000
Raw material	12,00,000
Wages (15 days in arrears)	9,60,000
Manufacturing and General expenses (one month in arrears)	12,00,000
Administration expenses (one month in arrears)	4,80,000
Sales promotion expenses (payable half yearly in advance)	2,00,000

The company enjoys one month's credit from the suppliers of raw materials and maintains 2 months stock of raw materials and 1 ½ months finished goods. Cash balance is maintained at Rs. 1,00,000 as a precautionary balance. Assuming a 10% margin, find out the working capital requirement of XYZ Ltd.

Solution :

Statement of Working Capital Requirement

1. Current Assets :	Amt. (Rs.)
Debtors ($40,00,000 \times 3/12 \times 80\%$) (at cost of goods sold)	8,00,000
Raw material stock ($2/12$ of 12,00,000)	2,00,000
Finished goods stock ($1\frac{1}{2}$ months of cost of production) (Cost of production being 80% of sales of 40,00,000)	4,00,000
Advance payment of sales promotion	1,00,000
Cash	<u>1,00,000</u>
Total Current assets	<u>16,00,000</u>
2. Current liabilities :	
Sundry creditors ($1/12$ of 12,00,000)	1,00,000
Wages (arrears for 15 days) ($1/24$ of 9,60,000)	40,000
Manu. and Gen. exp. (arrears for 1 month) ($1/12$ of 12,00,000)	1,00,000
Administrative exp. (arrears for 1 months) ($1/12$ of 4,80,000)	<u>40,000</u>
Total Current liabilities	<u>2,80,000</u>
Excess of Current Assets and Current Liabilities	13,20,000
Add 10% margin	<u>1,32,000</u>
Net working capital requirement	<u>14,52,000</u>

Q12. Galfam Ltd. is presently operating on single shift basis and has the following cost structure (per unit) :

Selling Price Rs. 36	Raw Materials	Rs. 12
	Wages (60% Variable)	Rs. 10
	Overheads (20% Variable)	Rs. 10
		<u>Rs. 32</u>

For the year ending March, 31, 2000; the sales amounted to Rs. 8,64,000 and the current asset position on that day was follows :

Raw material	Rs. 72,000
Finished Goods	1,44,000
Working in progress (Prime Cost)	44,000
Debtors	2,16,000

At present the company receives a credit of 2 months from the Supplier of raw materials and Wages & expenses are payable with a time lag of half a month.

In order to meet the extra demand, the company is preparing to work in double shift. The increase production will enable the firm to get a 10% discount from the supplier of raw materials. There will not be any change in fixed cost, credit policy etc.

Ascertain the effect on requirement for working capital if the proposal of double shift.

Solution :

In order to calculate the working capital requirement for double shift operations, the existing parametres should be ascertained as follows :

Present Position : Sales (Rs. 8,64,000 ÷ 36) = 24,000 Units of 2,000 units per month

Debtors : $(2,16,000 \div 8,64,000) \times 12 = 3$ months Outstanding.

Raw Material : $(72,000 \div 12) = 6,000$ Units or 3 months requirement.

Work in Process : $(44,000 \div 22) = 2,000$ Units or 1 months

Finished Goods : $(1,44,000 \div 32) = 4,500$ units or 2.25 months requirement.

New Cost of Raw Material : Rs. 12–10 of 12 = Rs. 10.80

Working Capital Requirement

Single Shift (Present Position)		Double Shift (Proposed Position)	
Current Assets	Amount	Current Assets :	Amount
Raw Materials (Given)	72,000	Raw Material $(4,000 \times 3 \times 10.80)$	1,29,600
Work in process (Given)		Work in process $(4,000 \times 20.80)$	83,200
(2000×12)	24,000	Finished Goods $(4,000 \times 2.25 \times 30.80)$	2,77,200
Finished Goods (Given)	1,44,000	Debtors at cost $(4,000 \times 3 \times 30.80)$	3,69,600
Debtors at cost $(2,000 \times 3 \times 32)$	1,92,000	Total Current Assets :	8,59,600
Total Current Assets :	4,52,000	Less Current Liabilities :	
Less Current Liabilities :		Creditors $(4,000 \times 10.80 \times 2)$	86,400
Creditors : $(2,000 \times 12 \times 2)$	48,000	Wages & Expenses $(4,000 \times 10.80 \times 2)$	40,000
Wages & Expenses		Working Capital Requirement	7,33,200
$(2,000 \times 20 \times \frac{1}{2})$	20,000		
Working Capital Requirement	3,84,000		

So, the Working Capital requirement will increase by $(Rs. 7,33,200 - 3,84,000) = Rs. 3,49,200$ due to change from single shift to double shift operations.

Q13. (a) A portfolio consists of three securities *P*, *Q* and *R* with the following parameters.

	P	Q	R	Correlation Coefficient
Expected return (%)	25	22	20	
Standard deViation (%)	30	26	24	
Correlation Coefficient				
	PQ			– 0.5
	QR			+ 0.4
	PR			+ 0.6

If the securities are equally weighted, how much is the risk and return of the portfolio of these securities?

Solution :

The portfolio return is

$$E(R_p) = (25) (1/3) + 22 (1/3) + 20 (1/3) \\ = 22.33\%$$

$$s_p^2 = (30)^2 (1/3)^2 + (26)^2 (1/3)^2 + (24)^2 (1/3)^2 + 2(1/3) (1/3) \\ (-.5) (30) (26) + 2 (1/3) (1/3) (.4) (26) (24) + 2(1/3) (1/3) (.6) (30) (24) \\ = 100 + 75.11 + 64 - 86.67 + 55.47 + 96 = 303.91$$

$$s_p = \sqrt{303.91} = 17.43\%$$

(b) From the following data compute beta of security *j* :

$$s_j = 12\%; s_m = 9\% \text{ and } Cor_{jm} = + 0.72$$

Solution :

$$b_j = \frac{\sigma_j \sigma_m Cor_{jm}}{\sigma_m^2} \\ = \frac{12 \times 9 \times .72}{9^2} \\ = \frac{77.76}{81} = 0.96$$

(c) Calculate the expected rate of return for security *i* from the following information :

$$R_f = 10\%; R_m = 18\%; b_i = 1.35$$

Solution :

The expected return of security *i* will be :

$$E(R_i) = R_f + (R_m - R_f) b_i \\ = 10\% + (18\% - 10\%) 1.35 \\ = 10\% + 10.8\% \\ = 20.8\%$$

Q14. Pee Company has decided to acquire Kay company. The following are the relevant financial data for the companies :

	Pee Co.	Kay Co.
Net sales (Rs lakh)	350	45
Profit after tax (Rs lakh)	28.13	3.75
Number of shares (lakh)	7.50	1.50
Earnings per share(Rs)	3.75	2.5
Dividend per share (Rs)	1.30	0.60
Total market capitalization (Rs lakh)	420	45

Calculate : (a) pre-merger market value per share for both companies, (b) post-merger EPS, market value per share and price-earnings ratio if Kay's shareholders are offered a share of (i) Rs 30, or (ii) Rs 56, or (iii) Rs 20 in share exchange for merger, (c) pee's EPS if Kay's shareholders are offered Rs 100, 15 per cent convertible debenture for each 3 shares held in kay, and (d) post-merger dividend or interest available to Kay's shareholders with exchanges referred in (b) and (c) Assume 50 per cent tax rate.

Solution :

(a) Pre-Merger market value per share :

$$= \frac{\text{Market capitalization}}{\text{Number of shares}}$$

$$\text{Pee : } 420/7.50 = \text{Rs } 56$$

$$\text{Kay : } 45/1.50 = \text{Rs } 30$$

(b) Share exchange ratio :

$$(i) 30/56 = .536$$

$$(ii) 56/56 = 1$$

$$(iii) 20/56 = .357$$

Number of shares of the surviving company :

$$(i) 7.5 + (.536 \times 1.5) = 8.30$$

$$(ii) 7.5 + (1 \times 1.5) = 9.00$$

$$(iii) 7.5 + (.357 \times 1.5) = 8.04$$

Combined EPS : Combined PAT/Combined number of shares

$$(i) (28.13 + 3.75)/8.30 = \text{Rs } 3.84$$

$$(ii) (28.13 + 3.75)/9.00 = \text{Rs } 3.54$$

$$(iii) (28.13 + 3.75)/8.04 = \text{Rs } 3.97$$

Combined firm's P/E ratio = weighted average of the individual firm's pre-merger P/E ratio

$$(420/28.13) \times \{(28.13/(28.13 + 3.75))\} + (45/3.75) \times \{3.75/(28.13 + 13.75)\} \\ = 14.93 \times .882 + 12 \times .118 = 14.58$$

Market value per share of the surviving firm :

(i) $(3.84 \times 14.58) = \text{Rs } 56$

(ii) $(3.54 \times 14.58) = \text{Rs } 51.61$

(iii) $(3.97 \times 14.58) = \text{Rs } 57.88$

(c) Number of convertible debentures ; $1.50/3 = 0.50$ lakh

Interest on debenture $1.50 \times \text{Rs } 100 \times 15\% = \text{Rs } 7.5$ lakh

Combined profit after tax = $28.13 + 3.75 - 7.5 + .5 \times 7.5$

Pee's EPS after merger = $28.13/7.50 = \text{Rs } 3.75$

Note : Interest will be deducted from the combined profit but it will save tax at 50 percent tax rate .

(d) Dividend to Kay's shareholders after merger :

Exchange of shares :

(i) $0.804 \times 1.30 = \text{Rs } 1.05$ lakh

(ii) $1.50 \times 1.30 = \text{Rs } 1.95$ lakh

(iii) $0.536 \times 1.30 = \text{Rs } 0.70$ lakh

Interest $0.50 \times 100 \times .15 = \text{Rs } 7.50$ lakh

Post-merger dividend : $1.50 \times .6 = \text{Rs } 0.90$ lakh

Q15. Small Company is being acquired by Large Company on a share exchange basis. Their selected data are as follows :

	<i>Large</i>	<i>Small</i>
Profit after tax (Rs lakh)	56	21
Number of shares (lakh)	10	8.4
Earnings per share (Rs)	5.6	2.5
Price-earnings ratio	12.5	7.5

Determine (a) pre-merger, market value per share, and (b) the maximum exchange ratio Large Company should offer without the dilution of (i) EPS (ii) market value per share.

Solution :

(a) Pre-merger market-value per share : P/E ratio $\times$ EPS

Large : $12.5 \times 5.6 = \text{Rs } 70$

Small : $7.5 \times 2.5 = \text{Rs } 18.75$

(b) (i) Maximum exchange ratio without dilution of EPS :

Pre-merger PAT of Large (Rs lakh)	56
Pre-merger PAT of small (Rs lakh)	21
Combined PAT without Synergy (Rs lakh)	77
Large's EPS	5.6
Maximum number of shares of Large after merger ($77/5.6$) (lakh)	13.75
Existing number of shares (lakh)	10.00
Maximum number of shares to be exchanged (lakh)	3.75
Maximum share exchange ratio : $3.75/8.4$	

(ii) Maximum exchange ratio without dilution of market value per share :

Pre-merger market capitalization of Large :	
$MV \times \text{No. of shares} = \text{Rs } 70 \times 10 \text{ lakh}$	700
Pre-merger market capitalization of small :	
$MV \times \text{No. of shares} = \text{Rs } 18.75 \times 8 \text{ lakh}$	157.5
Combined market capitalization (Rs lakh)	857.5
Current market value per share for Large's shareholders (Rs)	70
Maximum number of shares of Large (surviving company) ($850/70$) (lakh)	12.25
Current number of shares of Large (lakh)	10.00
Maximum number of shares to be exchanged (lakh)	2.25
Maximum shares exchanged ratio : $2.25/10$	.225

Note : In a share exchange, there would not be dilution of EPS if the acquiring company offers to pay a P/E ratio for the acquired firm's shares equal to its pre-merger P/E ratio. Large has a P/E ratio of 12.5 and the acquired firm's pre-merger EPS is Rs 2.5. Thus it could offer upto $12.5 \times 2.5 = \text{Rs. } 31.25$ for small's shares. The maximum exchange ratio is : $31.25/70 = .446$.

Q16. XYZ Company is acquiring PQR Company. XYZ will pay .5 of its shares to the shareholders of PQR for each share held by them. The data for the two companies are as given below :

	XYZ	PQR
Profit after tax (Rs lakh)	150	30
Number of Shares (lakh)	25	8
Earnings per share (Rs)	6.00	3.75
Market price of share (Rs)	78.00	33.75
Price-earnings ratio	13	9

Calculate the earnings per share of the surviving firm after merger. If the price-earnings ratio falls to 12 after the merger, what is the premium received by the shareholders of PQR (using the surviving firm's new price)? Is the merger beneficial for XYZ shareholders?

Solution :

Combined profit after tax = 150 + 30 = Rs. 180 lakh

Combined shares = 25 + .5(8) = 29 lakh

EPS = 180/29 = Rs. 6.21

Market price after merger = $P/E \times EPS$

= 12 × 6.21 = Rs. 47.52

Premium = $\{.5 (74.52) - 33.75\} / 33.75 = (37.26 - 33.75) / 33.75 = .104$ or 10.4%

The merger is not beneficial to XYZ's shareholders because their price falls from Rs. 78 to Rs. 74.52 — a loss of 4.5 per cent.

Q17. Gama Fertilizers Company is taking over Theta Petrochemical Company. The shareholders of Theta would receive 0.8 shares of Gama for each share held by them. The merger is not expected to yield in economics of scale and operating synergy. The relevant data for the two companies are as follows :

	<i>Gama</i>	<i>Theta</i>
Net sales (Rs crore)	335	118
Profit after tax (Rs crore)	58	12
Number of share (crore)	12	3
Earnings per share (Rs)	4.83	4.00
Market value per share (Rs)	30	20
Price-earnings ratio	6.21	5.00

For the combined company (after merger), you are required to calculate (a) EPS, (b) P/E ratio, (c) market value per share, (d) number of shares, and (e) total market capitalization. Also calculate the premium paid by Gama to the shareholders of Theta.

Solution :

Premium Paid to Theta's shareholders

Value of each share in Gama : 0.8 × Rs 30 = Rs 24

Value of Theta's share before merger = Rs 20

Premium = Rs 4

Premium percentage = $4/20 = 20$ per cent

Number of shares paid to Theta's shareholders : $3 \times .8 = 2.4$ crore

Q18. (a) Asset Securitization

Asset Securitization is the process by which non-tradable assets are converted into tradable securities. Assets like mortgage loans receivables, cash credit receivables, etc. on the balance sheet of use originator (say, Housing Finance companies, financial industries, etc) are packaged, underwritten and sold in the form of securities to investors through a carefully structured process. These securities may be in the form of commercial paper, Certificate of Deposits, Notes or any other form of security permissible under the legal framework in the country.

Benefits to the Investor :

The investor gets a security, which is backed by adequate collateral security and has credit enhancement. Those securities are rated by the credit rating agencies.

Asset Securitization process :

- (a) The originator, owing the assets, identifies a pool of homogeneous assets, which is held for securitization.
- (b) The pool of assets is then transferred to a different entity, known as Special Purpose Vehicles (SPV).
- (c) The SPV issues the securities backed by the pool of assets. They also indicate the liability for the cash consideration received from the investors.
- (d) The consideration is remitted by the SPV to the originator, which then replaces the securitized assets from its balance with the consideration received.

(b) Difference between: Factoring Vs. Securitization**Factoring**

1. One party involved
2. May be done with or without recourse
3. Payment from the factor is received after a time lag
4. Additional services like credit checking, ledger maintenance are offered
5. Short term receivables are factored
6. Credit rating is not compulsory
7. Existing receivables can be factored

Securitization

1. Generally a wide range of investors are involved
2. Done without recourse
3. Cash is generally received as soon as the issue is placed
4. No such additional services are offered.
5. Long term receivables are securitized
6. Credit rating is compulsory
7. Along with existing receivables, future receivables can also be securitized.

Q19. (a) ABC Ltd. wants to raise Rs. 5,00,000 as additional capital. It has two mutually exclusive alternative financial plans. The current EBIT is Rs. 17,00,000 which is likely to remain unchanged. The relevant Information is —

Present Capital Structure:	3,00,000 Equity shares of Rs. 10 each and 10% Bonds of Rs. 20,00,000
Tax Rate:	50%
Current EBIT:	Rs. 17,00,000
Current EPS:	Rs. 2.50
Current Market Price:	Rs. 25 per share
Financial Plan I:	20,000 Equity Shares at Rs. 25 per share.
Financial Plan II:	12% Debentures of Rs. 5,00,000.

What is the indifference level of EBIT? Identify the financial break-even levels and plot the EBIT-EPS lines on graph paper. Which alternative financial plan is better?

Solution :

1. Computation of EBIT - EPS Indifference Point

Particulars	Financial Plan I Rs.		Financial Plan II Rs.
Owner's Funds (3,00,000 × 10 + 20,000 × 25)	35,00,000	3,00,000 × 10	30,00,000
Borrowed Funds (given)	<u>20,00,000</u>	20,00,000 + 5,00,000	<u>25,00,000</u>
Total Capital Employed	<u>55,00,000</u>		<u>55,00,000</u>

Particulars	Financial Plan I Rs.		Financial Plan II Rs.
EBIT (let it be Rs. X)	X		X
Less : Interest			
20,00,000 × 10%	2,00,000	(20,00,000 × 10% + 5,00,000 × 12%)	2,60,000
EBT X—	2,00,000	X—	2,60,000
Less : Tax at 50% ½ X—	1,00,000	½ X—	1,30,000
EAT ½ X—	1,00,000	½ X—	1,30,000

Number of Equity Shares $3,00,000 + 20,000 = 3,20,000$ (given) 3,00,000

EPS $[\frac{1}{2}X - 1,00,000] \div 3,20,000$ $[\frac{1}{2}X - 1,30,000] \div 3,00,000$

For indifference between the above alternatives, EPS should be equal.

$$\text{Hence, we have } \frac{[\frac{1}{2}X - 1,00,000]}{3,20,000} = \frac{[\frac{1}{2}X - 1,30,000]}{3,00,000}$$

On Cross Multiplication, $15X - 30 \text{ Lakhs} = 16X - 41.6 \text{ Lakhs}$; or $X = 11.6 \text{ Lakhs}$

Hence EBIT should be **Rs. 11.60 Lakhs** and at that level, EPS will be **Rs. 1.50** under both alternatives.

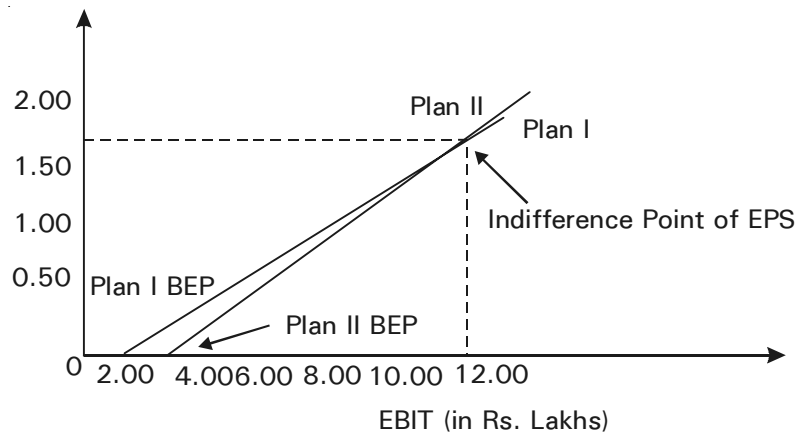
2. Computation of Financial Break-Even Point

The Financial BEP for the two plans are—

Plan I EBIT = Rs. 2,00,000 (i.e. 10% interest on Rs. 20,00,000)

Plan II EBIT = Rs. 2,60,000 (i.e. 10% interest on Rs. 20,00,000 and 12% interest on Rs. 5,00,000)

3. Graphical Depiction of Indifference Point and Financial BEP



4. Interpretation of Graph:

- The horizontal intercepts identify the Financial Break Even levels of EBIT for each plan.
- The point at which EPS lines of both plans intersect is called Indifference Point. Its horizontal intercept gives the level of EBIT at that point. The vertical intercept gives the value of EPS at that point.
- Below the indifference point, one plan will have EPS over the other. Above that point, automatically the other plan will have higher EPS over the former. This is interpreted as under:

Interpretation of the Indifference Point

EBIT below Indifference Point:

Option with lower debt (interest burden): when the rate of earnings and operating profits (EBIT) are low, more interest and debt burden is not advisable. A high DOL should be properly managed by low Financial Leverage

EBIT equal to Indifference Point :

Any alternative can be chosen.

Same EPS due to indifference point.

EBIT above the Indifference Point :

Option with higher debt (Interest Burden)

When EBIT is high, financial leverage works favourably the EPS is maximised. Low DOL should be coupled with high DFL, to maximize gain for Equity Shareholders.

Q20. Working Capital of a Company is Rs. 1,35,000 and Current Ratio is 2.5. Liquid Ratio is 1.5 and the Proprietary Fund 0.75. Bank Overdraft is Rs. 30,000 there are no Long - Term Loans and fictitious Assets. Reserves and Surplus ?? amount to Rs. 90,000 and the Gearing Ratio [Equity Capital ? Preference Capital] is 2.

From the above, ascertain the following items and draw the Statement of Proprietary Fund.

- | | |
|--------------------------|--------------------------------------|
| (i) Current Assets | (v) Quick Liabilities |
| (ii) Current Liabilities | (vi) Quick Assets |
| (iii) Net Block | (vii) Stock and |
| (iv) Proprietary Fund | (viii) Preference and Equity Capital |

Solution :

$$1. \text{ Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}} = 2.5 \text{ times. So, Current Assets} = 2.5 \times \text{Current Liabilities}$$

$$\begin{aligned} 2. \text{ Net Working Capital} &= \text{Current Assets} - \text{Current Liabilities} = \text{Rs. 1,35,000} \\ &= 2.5 \times \text{Current Liabilities} - \text{Current Liabilities Rs. 1,35,000} \\ &= 1.5 \times \text{Current Liabilities} = \text{Rs. 1,35,000.} \\ \text{So, Current Liabilities} &= \text{Rs. 1,35,000 ? ?} \end{aligned}$$

$$\begin{aligned} \text{Therefore, Current Liabilities} &= \text{Rs. 90,000 and hence Current Assets} = 2.5 \times 90,000 \\ &= \text{Rs. 2,25,000} \end{aligned}$$

$$\text{Quick Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}} = 2.5 \text{ times So, } \frac{\text{Current} - \text{Stock}}{\text{Current Liability} - \text{Bank OD}} = 1.5 \text{ times}$$

$$\text{On substitution, } \frac{\text{Rs. 2,25,000} - \text{Stock}}{\text{Rs. 90,000} - \text{Rs. 30,000}} = 1.5 \text{ times}$$

$$\text{On solving, we get, Stock} = \text{Rs. 1,35,000}$$

Since there are no Loans or Fictitious Assets.

$$\text{Capital Employed} = \text{Proprietary Fund} = \text{Fixed assets} + \text{Net Working Capital.}$$

$$\text{Proprietary Ratio} = \frac{\text{Proprietary Funds}}{\text{Total Assets}} = 0.75. \frac{\text{Fixed Assets} + \text{Net Working Capital}}{\text{Fixed Assets} + \text{Current Assets}} = 0.75$$

$$\frac{\text{Fixed Assets} + \text{Rs. 1,35,000}}{\text{Fixed Assets} + \text{Rs. 2,25,000}} = 0.75$$

On cross multiplication, we have,

$$(\text{Fixed Assets} + 1,35,000) = 0.75 \times (\text{Fixed Assets} + 2,25,000)$$

$$\text{Solving, we get Fixed Assets} = \text{Rs. 1,35,000}$$

Proprietary Fund is analysed as under —

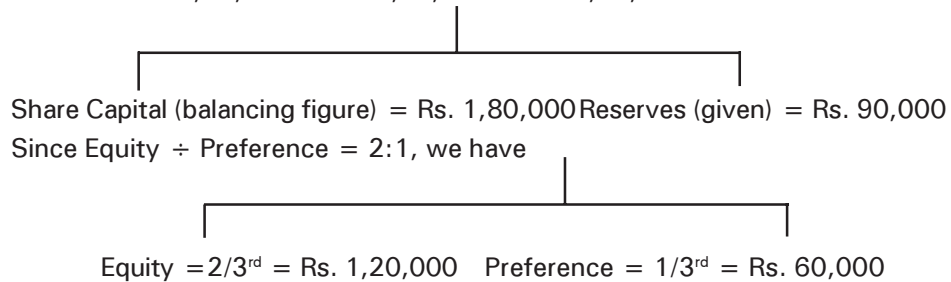
$$\text{Total Proprietary Fund} = \text{Fixed Assets} + \text{Net Working Capital}$$

$$= \text{Rs. } 1,35,000 + \text{Rs. } 1,35,000 = \text{Rs. } 2,70,000$$

Proprietary Fund is analysed as under —

$$\text{Total Proprietary Fund} = \text{Fixed Assets} + \text{Net Working Capital}$$

$$= \text{Rs. } 1,35,000 + \text{Rs. } 1,35,000 = \text{Rs. } 2,70,000$$



6. Statement of Proprietary Funds

Particulars				Rs.	Rs.
Capital employed in:					1,35,000
1. Fixed Assets					
2. Working capital					
- Current Assets Stock				1,35,000	
Others				90,000	
				2,25,000	
- Current Liabilities Bank OD				30,000	
Other CL				60,000	
				<u>90,000</u>	1,35,000
Total Funds Employed					2,70,000
Less: Long Term External Liabilities					Nil
Proprietary Funds Employed					2,70,000
Represented by:	1. Share capital (a) Equity			1,20,000	
	(b) Preference			<u>60,000</u>	
				1,80,000	
	2. Reserves and Surplus			<u>90,000</u>	2,70,000

Q21. The following is the income statement of XYZ Company for the year ended March 2009 :

Particular	Rs.	Rs.
Income : Sales		1,62,700
Equity in ABC Company's Earning		6,000
Total Income		1,68,700
Expenses : Cost of Goods sold	89,300	
Salaries	34,400	
Depreciation	7,450	
Insurance	500	
Research & Development	1,250	
Patent Amortisation	900	
Interest	10,650	
Bad Debt	2,050	
Income Tax Current 6,000		
Deferred 1,550	8,150	
Total Expenses		1,54,650
Net Income		14,050

Additional Information are :

- (i) 70% of Gross Revenue from Sales were on Credit
- (ii) Merchandise Purchase amounting to Rs. 92,000 were on Credit
- (iii) Salaries Payable totalled Rs. 1,600 at the end of the year
- (iv) Amortisation of Premium on Bonds Payable was Rs. 1,350.
- (v) No dividends were received from the other Company.
- (vi) XYZ Company declared Cash Dividend of Rs. 4,000
- (vii) Changes in Current Assets and Current Liabilities were as follows:

Item	Increase / (Decrease) Rs.
Cash	500
Marketable Securities	1,600
Accounts Receivable	(7,150)
Allowance for Bad Debt	(1,900)
Inventory	2,700
Prepaid Insurance	700
Accounts Payable (form merchandise)	5,650
Salaries Payable	(2,050)
Dividends Payable	(3,000)

Prepare a Statement showing the amount of Cash Flow from Operations.

Solution:

Computation of Cash Flow from Operations		
Particulars	Rs.	Rs.
Net Profit considering Tax and Extra-Ordinary Item	(14,050 + 8,150)	22,200
Adjustments for:		
Bad Debts	2,050	
Interest	10,650	
Patent Amortisation	900	
Depreciation	7,450	
Income from ABC Co.	<u>6,000</u>	
		15,050
Operating Profit before Working capital changes		37,253
Adjustments for Working capital changes		
Decrease in Accounts Receivable	7,150	
Decrease in Allowance for Bad Debts	(1,900)	
Increase in Inventory	(2,700)	
Increase in Prepaid Insurance	(700)	
Increase in Accounts Payable	5,650	
Decrease in Salaries Payable	(2,050)	
Decrease in Dividends Payable	<u>(3,000)</u>	
Cash Flow from Operations		39,700
Less: Taxes Paid (Current Tax only)		(6,000)
Net Cash Flow from Operation		33,100

Notes:

1. Research and Development Expenses is treated as incurred during the period and not as an amortization. Hence, it will not be added back as a non-cash item.
2. Marketable Securities are treated as "Cash Equivalents" and not as a Working Capital item. Hence, it is not adjusted in the above statement. Alternatively, it can be considered as a Working Capital item also.
3. Allowance for Bad Debts is considered as a Provision against Debtors and hence the treatment is the reverse of that accorded for Debtors.

Q22. (a) SWOT Analysis

(b) Invisible walls in Project Estimating.

Answer 22.**(a) SWOT Analysis :**

In case of existing companies which are proposing diversification and expansion plans, will conduct a detailed study about the strengths, weaknesses, opportunities and threats on the basis of its past business experience. By conducting SWOT Analysis, the strengths and weakness of the proposed project is highlighted. Some of the aspects considered in SWOT analysis are as follows :

- Internal financial resources.
- Availability of funds in the capital market.
- Extent of support from Bank and financial institutions.
- Existing and proposed level of investments and its Impact on ROCE and market value of the firm.
- The business and financial risk attached to the firm.
- Technology developed internally or possibility to obtain reliable technical know-how at cheaper cost.
- Brand loyalty of existing products.
- Source of raw material, and other infrastructural facilities.
- Market share, distribution network.
- Severity of competition.
- Cost of production and managerial competence.
- Cost of capital
- Governmental clearances and permissions.
- Macro and Micro economic environment in which the business operates *etc.*

(b) Invisible walls in Project Estimating :

The project estimating is an important aspect in preparation of project report and its implementation. While estimating, it is not possible to achieve 100% accuracy in estimating, and the fact should be recognised that there are certain invisible walls which makes the estimates to be inaccurate. Some of the invisible walls are as follows :

- Delays in governmental clearances.
- Delays in obtaining sanction of loans from financial Institutions.
- Reliability of contractors.
- Hurdles from the local people near the project site.
- Political disturbances.
- Foreign exchange rate variations.
- Unable to quantify the risk properly.
- Locational disadvantages.
- Uncertainty of Market and change in consumer preferences.
- Lack of reliable technology.

- Lack of flexibility.
- Financial soundness of participating investors.
- Unforeseen competition *etc.*

Q23. O.B.C Lt. is evaluating its Research and Development programme for the year 2004. The five projects under consideration all appear to offer favourable profitability if they can be carried out successfully to completion. But Rs. 10 lakhs only has been provided against R & D in the Budget for 2004.

The following information is relevant :

Project	Expenditure (Rs. Lakhs)		Probability of success	
To date	To complete	Commercially	Technically	
1	15	1	0.7	0.4
2	12	3	0.8	0.5
3	11	3	0.5	0.9
4	6	7	0.4	0.5
5	4	10	0.3	0.9

Which projects should be completed in 2004 and why?

Answer 23.

Expenditure incurred on Research and Development till date is not relevant for decision making, since it is a sunk cost. The amount of Rs. 10 lakhs allocated for R & D should be properly utilised keeping in view the funds constraint.

Project of success	Joint probability to complete (Rs. lakhs)	Expenditure expenditure for success	Weighted
1	0.28	1	0.28
2	0.40	3	1.20
3	0.45	3	1.35
4	0.20	7	1.40
5	0.27	10	2.70

Projects 3 and 4 together have the greatest weight for success, 2.75. They just cost the budgeted provision of Rs. 10 lakhs to complete. So, Projects 3 and 4 should be completed in the year 2004.

Q24. Daily demand (x) for pieces of bread at a grocery store is given by the following probability distribution:

	x	100	150	200	250	300
Pr. = Probability	(x)	0.20	0.25	0.30	0.15	0.10

If a piece of bread is not sold the same day, it can be disposed of at 15 paise per piece at the end of the day. Otherwise the price of a fresh piece is 49 paise. The cost per piece to the store is 25 paise.

If the optimum level of stocking is 200 pieces pf bread daily, then find: (i) Expected Monetary Value (E.M.V) of this optimum stock level. (ii) Expected Value of Perfect Information (E.V.P.I)

*pr. = Probability

Solution :

Cost of bread = 25 paise per piece

selling price = 49 paise per piece if sold the same day or 15 paise if sold at the end of the day.

(I) Calculation of Expected Monetary Value (EMV) for Optimum Level of Stocking of 200 pieces of bread daily

Demand	Probability 200 pieces(Rs.)	Payoff for stocking Payoff (Rs.)	Expected
100	0.20	14.00	2.80
150	0.25	31.00	7.75
200	0.30	48.00	14.40
250	0.15	48.00	7.20
300	0.10	48.00	4.80
	36.95		

Therefore, the required EMV = Rs. 36.95

Demand	Probability 200 pieces(Rs.)	Payoff for stocking Payoff (Rs.)	Expected
100	0.20	24.00	4.80
150	0.25	36.00	9.00
200	0.30	48.00	14.40
250	0.15	60.00	9.00
300	0.10	72.00	7.20
	44.40		

Q25. (a) Direct quote for pounds Sterling in New York is 1.5636. Compute direct quote in London.

(b) Assuming you are the calling bank and the following rates per \$ is quoted against S F.

Day	Quotes
1	1.6962/78
2	1.6990/1.7005
3	1.7027/42
a.	On which day is it cheaper to buy US \$ with respect to SF?
b.	How mny US \$ do you need to buy 1000 SF on Day 1?
c.	What is the spread on Day 2?
d.	If you exchanged \$ 2500 for SF 4256.75 on which day. did you exchange?

Solution :

- (a) Direct Quote in US will be £ quote in terms of \$. Therefore $£1 = \$1.5636$
 In London Direct Quote will be \$ quote in terms of £ Le. $\$1 = 1/1.5636 = £0.6395$
- (b) Please note that the rates are given for Dollars against SF Le. (SF/\$)
- The dollar is cheap to bY on the 1st day.
 - Here we need to buy SFr 1000. Thus we require a quote in SFr.. Since we have a \$ quote, we convert to a SFr. quote, which is simply the inverse.
 $\$1 = S f 1.6962/1.6978$

$$S f 1 = \$ 0.5890/0.5896$$

To buy 1000 Sf we have to pay (buyer pays more)
 $= 1000.0.5986 = \$598.60$

- Spread on day 2 $= 1.7005 - 1.6990 = 0.0015 = 15 \text{ points}$
- \$2500 $= S f 4256.75$

$$\text{Therefore } \$1 = S f 4256.75/2500 = S f 1.7027$$

This matches with the bid rate on the 3rd day.

Q26. (a) In the inter-bank market, the OM is quoting Rs.21.50. If the bank charges 0.125% commission for IT selling and 0.15% for TT buying, what rate should it quote?

Solution :

$$\text{IT selling rate} = 21.50 (1 - 0.00125) = \text{As. } 21.47/\text{DM}$$

$$\text{IT buying rate} = 21.50 (1 + 0.00150) = \text{As. } 21.53/\text{DM}$$

Q26. (b) The price of Swedish Kroner is \$0.14 today. If it appreciates by 10% today, how many Kroner a dollar will buy tomorrow?

Solution:

The price of Swedish Kroner is \$0.14 today. A 10 percent appreciation will make it worth \$0.154 tomorrow. A dollar will buy $1/0.154 = 6.49351$ Kroner tomorrow.

Q27. (a) Given the following quotes for per unit of each currency against US dollar, on two different dates :

British pound	1.5398	1.6385
Canadian dollar	0.6308	0.6591
EMU euro	0.9666	1.0835
Japanese yen	0.008273	0.008343
Mexican peso	0.1027	0.0917
Swedish krona	0.1033	0.1179

What is the rate of appreciation or depreciation of each currency over the period?

Solution :

Pound	$= (\$1.6385 - \$1.5398)/\$1.5398 = +0.0641 = +6.41\%$
Canadian dollar	$= (\$0.6591 - \$0.6308)/\$0.6308 = +0.0449 = +4.49\%$
Euro	$= (\$1.0835 - \$0.9666)/\$0.9666 = +0.1209 = +12.09\%$
Yen	$= (\$0.008343 - \$0.008273)/\$0.008273 = +0.0085 = +0.85\%$
Peso	$= (\$0.0917 - \$0.1027)/\$0.1027 = -0.1071 = -10.71\%$
Krona	$= (\$0.1179 - \$0.1033)/\$0.1033 = +0.1413 = +14.13\%$

Q27. (b) The exchange rate for Mexican peso was 0.1086 in December 2004, and 0.0913 in November 2004, against dollar. Which currency has depreciated and by how much?

Solution :

Nov 2004 rate : Peso1 = \$ 0.1086

Dec 2004 rate : Peso1 = \$ 0.0913

This means Mexican peso has depreciated against the US dollar.

The rate of depreciation of Peso can be calculated as:

$$(0.0913 - 0.1086)/0.1086 = -0.159$$

In other words, from November 2004 to December 2004, the Mexican peso depreciated 15.9% against the US dollar.

Q28. (a) The dollar is currently trading at Rs. 40. If Rupee depreciates by 10%, what will be the spot rate? If dollar appreciates by 10% what will be the spot rate?

Solution :

To find appreciation or depreciation of a rupee, we need to have a quote of Re. Since we are given \$ quote, we need to convert the same to Re. quote. (which is simply the inverse)

i.e. Re. 1 = \$1/40 = \$ 0.025

If rupee depreciates by 10%, then $= 0.025 - 0.0025 = 0.0225$

The new spot rate would be \$1 = Re.0.0225

And, if dollar appreciates by 10%, then we can apply 10% directly to the given \$ quote. Therefore, $40 + 40 \times 0.1 = 44$

The new spot rate would be \$1 = Rs.44

Q28. (b) Consider the following quotes.

Spot (Euro/Pound) = 1.6543/1.6557

Spot (Pound/NZ\$) = 0.2786/0.2800

- 1. Calculate the % spread on the Euro/Pound Rate**
- 2. Calculate the % spread on the Pound 1 NZ \$ Rate**
- 3. The maximum possible % spread on the cross rate between the Euro and the NZ \$**

Solution :

$$a. \quad \text{The \% spread on Euro/Pound} = \frac{1.6557 - 1.6443}{1.6543} \times 100 = 0.085\%$$

$$b. \quad \text{The \% spread on Pound/ NZ \$} = \frac{0.2800 - 0.2786}{0.2786} \times 100 = 0.50\%$$

c. The maximum possible % spread on the cross rate between c & NZ \$[®] To find cross rate first.

$$\text{Given Spot (Euro/Pound)} = 1.6543/1.6557$$

$$\text{Spot (Pound/NZ \$)} = 0.2786/0.2800$$

$$\text{Spot (Euro/NZ \$)} = 0.2786 \times 1.6543 / 0.2800 \times 1.6557$$

$$= 0.4609/0.4636$$

$$\text{The maximum \% spread on Euro/ NZ \$} = \frac{0.4636 - 0.4609}{0.4609} \times 100 = 0.59\%$$

Cross Rates**Remember the following before proceeding ahead****Rule 1**

$$\frac{A}{B} = \frac{A}{C} \times \frac{C}{B}$$

$$\text{Bid} \left(\frac{A}{B} \right) = \text{Bid} \left(\frac{A}{C} \right) \times \text{Bid} \left(\frac{C}{B} \right)$$

$$\text{Ask} \left(\frac{A}{B} \right) = \text{Ask} \left(\frac{A}{C} \right) \times \text{Ask} \left(\frac{C}{B} \right)$$

Rule 2

$$\text{Bid} \left(\frac{A}{B} \right) = \frac{1}{\text{Ask} \left(\frac{B}{A} \right)}$$

Q29. (a) Consider the following rates :

Spot	Rs./\$ 42.17/42.59
	Rs./DM 24.61/25.10
3-m forward	Rs./\$ 43.15/43.60
	Rs./DM 25.36/25.90

(i) From these rates calculate the spot and forward DM/\$ rates.**(ii) What are the upper and lower boundaries for the DM/\$ quotations.**

Solution :**Given :**

Spot Rs./\$ 42.17/42.59
Rs./DM 24.61/25.10
3-m forward Rs./\$ 43.15/43.60
Rs./DM 25.36/25.90

- (i) Calculation of Spot DM/\$ rates.

$$\text{We know that Bid} \left(\frac{\text{DM}}{\$} \right) = \text{Bid} \left(\frac{\text{DM}}{\text{Rs.}} \right) \times \text{Bid} \left(\frac{\text{Rs.}}{\$} \right)$$

We do not have a quote of DM/Rs., instead we have Rs./DM. Hence we use

$$\text{Bid} \left(\frac{\text{DM}}{\$} \right) = \frac{1}{\text{Ask} \left(\frac{\text{Rs.}}{\text{DM}} \right)}$$

Substituting, the values we get Bid rate for DM/\$ = $1/25.10 \times 42.17 = 1.6800$

$$\text{Similarly Ask} \left(\frac{\text{DM}}{\$} \right) = \text{Ask} \left(\frac{\text{Rs.}}{\$} \right) \times \frac{1}{\text{Bid} \left(\frac{\text{Rs.}}{\text{DM}} \right)} = 42.59 \times 1/24.61 = 1.7305$$

We thus get the (DM/\$) quote as = $1.6800/1.7305$

Calculation of 3m Forward DM/\$ rates

Similarly we get 3m Forward quote for (DM/\$) as $1.6660/1.7192$

- (ii) Upper boundary for spot rate is 1.7305
Lower boundary for spot rate is 1.6800
Upper boundary for forward rate is 1.7192
Lower boundary for forward rate is 1.6660

Q29. (b) Restate the following one-, three-, and six-month outright forward European term bid-ask quotes in forward points and bid-ask spreads in points.

Spot	1.3431-1.3436
One-Month	1.3432-1.3442
Three-Month	1.3448-1.3463
Six-Month	1.3488-1.3508

Solution :**Forward Points**

One-Month	01/06
Three-Month	17/27
Six-Month	57/72

Q29. (c) The following quotes are available

Spot (DM/\$) : 1.5105/1.5120

Three-month swap points : 25/20

Six-month swap points : 30/25

Calculate the three-month and six-month outright forward rates.

Solution :

In this case, swap points are given in descending order. Hence, we have to subtract the swap points from the spot rates to arrive at the outright forward rates. This will ensure that the spread widens (by subtracting the larger number from the bid rate and the smaller number from the offer rate) as the time horizon increases.

Three-month forward bid rate = $1.5105 - 0.0025 = 1.5080$

Three-month forward offer rate = $1.5120 - 0.0020 = 1.5100$

Six-month forward bid rate = $1.5105 - 0.0030 = 1.5075$

Six-month forward offer rate = $1.5120 - 0.0025 = 1.5095$

Q30. (a) You are given the following information

Spot DM/\$: 1.5105/1.5130

Three-month swap : 25/35

Spot \$/£ : 1.6105/1.6120

Three-month swap : 35/25

Calculate the three-month DM/£ rate.

Solution :

The first rule we apply is that when the swap points are in ascending order we add to the spot rate or when they are in descending order, we subtract from the spot rate in order to arrive at the forward rate. This is to increase the spread.

DM/\$ Three-month forward.

Bid : $1.5105 + 0.0025 = 1.5130$

Offer : $1.5130 + 0.0035 = 1.5165$

\$/£ Three-month forward :

Bid : $1.6105 - 0.0035 = 1.6070$

Offer : $1.6120 - 0.0025 = 1.6095$

To calculate the DM/£ forward bid and offer rates, we calculate :

$$\text{Bid} \left(\frac{\text{DM}}{\text{£}} \right) = \text{Bid} \left(\frac{\text{DM}}{\text{\$}} \right) \times \text{Bid} \left(\frac{\text{\$}}{\text{£}} \right) \quad \& \quad \text{Ask} \left(\frac{\text{DM}}{\text{£}} \right) = \text{Ask} \left(\frac{\text{DM}}{\text{\$}} \right) \times \text{Ask} \left(\frac{\text{\$}}{\text{£}} \right)$$

The forward bid rate = $\text{DM } 1.5130 \times 1.6070 = \text{DM } 2.431/\text{£}$

The forward ask rate = $\text{DM } 1.5165 \times 1.6095 = \text{DM } 2.441/\text{£}$

Thus, the forward quote will be DM/£ : 2.431/2.441

Q30. (b) A bank has to submit a quote to a customer for buying DM against Rupees. The customer will have the option of taking delivery of Rs. at the end of the second month. Given the following spot and forward rates what rate should it quote?

Rs./\$ Spot : 35.20/35.30
 One-month forward : 15/25
 Two-month forward : 20/30
 DM/\$ Spot : 1.51/1.52
 One-month forward : 15/10
 Two-month forward : 20/15.

Solution :

In this case, the outright Rs./\$ forward rates have to be obtained by adding swap points to the spot rates. In the case of DM/\$, the swap points have to be subtracted from the spot rates to obtain the outright forward bid rates.

Rs./\$:	One-month forward	:	Bid	:	35.20	+	0.15	=	35.35
			Offer	:	35.30	+	0.25	=	35.55
Rs./\$:	Two-month forward	:	Bid	:	35.20	+	0.20	=	35.40
			Offer	:	35.30	+	0.30	=	35.60
DM/\$:	One-month forward	:	Bid	:	1.51	-	0.15	=	1.36
	One-month forward		Offer	:	1.52	-	0.10	=	1.42
DM/\$:	One-month forward	:	Bid	:	1.51	-	0.20	=	1.31
	Two-month forward		Offer	:	1.52	-	0.15	=	1.37

Since the delivery is made during the second month, the bank will base its quotation on the rate prevailing for end of the second month.

When the bank sells DM for \$, it will base its rate on the one-month forward rate as this is the more diverse rate. Thus, it will have to sell DM 1.37 to obtain \$1.

When it sells \$1, it will base itself on the one-month rate. It will expect to get only Rs. 35.40 per \$. So, DM 1.37 = Rs. 25.84/DM.