

CRASH BATCH MAIN MATERIAL / CA INTER / GR. 2 / FINANCIAL MANAGEMENT PART III / 42.5E

CHAPTER INCLUDED – CAPITAL STRUCTURE

(APPLICABLE TO MAY 2020 ATTEMPT OF CA INTER. SYNCHRONISED WITH JULY 2019 EDITION OF ICAI SM. ISSUED ON 14/12/19)

5. CAPITAL STRUCTURE

NO. OF PROBLEMS IN 41.5E OF CA INTER: CLASSROOM - 19, ASSIGNMENT - 25

NO. OF PROBLEMS IN 42E OF CA INTER: CLASSROOM - 19, ASSIGNMENT – 19

NO. OF PROBLEMS IN 42.5E OF CA INTER: CLASSROOM -11 ,ASSIGNMENT – 11

SIGNIFICANCE OF EACH PROBLEM COVERED IN THIS CHAPTER

Problem No. in this material	Problem No. in NEW SM	Problem No. in OLD SM	Problem No. in OLD PM	RTP	MTP	Previous Exams	Remarks
CR 1	ILL-8	ILL-19	-	-	-	-	
CR 2	ILL-9	ILL-20	-	-	N18 (N)	N18 (N) - 5M	
CR 3	-	-	-	-	-	-	
CR 4	-	-	4	-	-	-	
CR 5	-	-	-	-	M18 (N) - 10M	-	
CR 6	-	-	-	-	-	-	
CR 7	-	-	-	-	-	-	
CR 8	-	-	-	-	M18 (O) - 5M	-	
CR 9	-	-	-	-	-	-	
CR 10	-	-	3	-	-	-	
CR 11	-	-	6	-	-	-	
ASG 1	-	-	-	-	-	-	
ASG 2	-	-	-	-	-	-	
ASG-3	-	-	-	-	-	-	
ASG 4	-	-	-	-	-	-	
ASG 5	-	-	10	-	-	-	
ASG 6	ILL 1	ILL 25	-	-	-	-	
ASG 7	ILL 3	ILL 27	-	-	-	-	
ASG 8	-	-	-	-	-	-	
ASG 9	-	-	-	-	-	-	-
ASG 10	-	-	9	-	M18 (N) - 5M	-	
ASG 11	-	-	-	-	-	M18 (N) - 10M	

MEANING OF CAPITAL STRUCTURE:

- Capital Structure refers to mix of sources, from where long term funds required for a business have to be raised. In other words, the proportion of Debt, Preference capital and Equity capital to be employed for an Investment.
- Capital structure decision is deciding about weightage of debt and equity and ultimately overall cost of capital as well as Value of a firm. So, capital structure is relevant in maximizing value of the firm and minimizing overall cost of capital.
- Capital Structure decision refers to deciding the forms of financing (which sources to be tapped); their actual requirements (amount to be funded) and their relative proportions (mix) in total capitalisation.
- Whenever funds are to be raised to finance investments, capital structure decision is involved. A demand for raising funds generates a new capital structure since a decision has to be made as to the quantity and forms of financing.

PROBLEMS FOR CLASSROOM DISCUSSION

MODEL 1: EBIT-EPS ANALYSIS

- The basic objective of financial management is to design an appropriate capital structure which can provide the highest Earnings Per Share (EPS) over the company's expected range of Earnings Before Interest and Taxes (EBIT).
- Therefore, in search for an appropriate capital structure for a firm, the financial manager requires to analyze the effects of various alternative capital structures on the EPS.
- Eventually, he has to choose best capital structure at which EPS is maximum.

PROBLEM NO 1: (PRINTED SOLUTION AVAILABLE) Best of Luck Ltd., a profit making company, has a paid-up capital of Rs. 100 lakhs consisting of 10 lakhs ordinary shares of Rs.10 each. Currently, it is earning an annual pre-tax profit of Rs.60 lakhs. The company's shares are listed and are quoted in the range of Rs.50 to Rs.80. The management wants to diversify production and has approved a project which will cost Rs.50 lakhs and which is expected to yield a pre-tax income of Rs.40 lakhs per annum. To raise this additional capital, the following options are under consideration of the management.

- a) To issue equity capital for the entire additional amount. It is expected that the new shares (face value of Rs.10) can be sold at a premium of Rs.15.
- b) To issue 16% non-convertible debentures of Rs. 100 each for the entire amount.
- c) To issue equity capital for Rs.25 lakhs (face value of Rs.10) and 16% non-convertible debentures for the balance amount. In this case, the company can issue shares at a premium of Rs.40 each.

You are required to advise the management as to how the additional capital can be raised, keeping in mind that the management wants to maximize the earnings per share to maintain its goodwill. The company is paying income tax at 50%.

(A) (NEW SM, OLD SM)

(ANS.: EXISTING EPS IS RS.3 & EPS FOR OPTION - a) IS RS.4.16, OPTION - b) IS RS.4.6, OPTION - c) IS RS.4.57 & OPTION - b. I.E., ISSUE OF 16% DEBENTURES IS MOST SUITABLE TO MAXIMIZE THE EARNINGS PER SHARE)

(SOLVE PROBLEM NO. 1, OF ASSIGNMENT PROBLEMS AS REWORK)

Note: _____

PROBLEM NO 2: The Modern Chemicals Ltd. requires Rs.25,00,000 for a new plant. This plant is expected to field earnings before interest and taxes of Rs.5,00,000. While deciding about the financial plan, the company considers the objective of maximizing earnings per share. It has three alternatives to finance the project - by raising debt of Rs.2,50,000 or Rs.10,00,000 or Rs. 15,00,000 and the balance, in each case, by issuing equity shares. The company's share is currently selling at Rs.150, but is expected to decline to Rs.125 in case the funds are borrowed in excess of Rs.10,00,000. The funds can be borrowed at the rate of 10% up to Rs.2,50,000, at 15% over Rs.2,50,000 and up to Rs.10,00,000 and at 20% over Rs.10,00,000. The tax rate applicable to the company is 50%. Which form of financing should the company choose?

(A) (NEW SM, OLD SM, SIMILAR: MTP N18, N18(N) - 5M)

(ANS.: EPS FOR OPTION I IS RS. 15.83, OPTION II IS RS. 18.125, OPTION III IS RS.16.41)

(SOLVE PROBLEM NO. 2 OF ASSIGNMENT PROBLEMS AS REWORK)

Note: _____

PROBLEM NO 3: (PRINTED SOLUTION AVAILABLE) AB Limited provides you with the following information:

Particulars	Rs.
Profit	3,00,000
Less: Interest on debentures (0.12)	60,000

FINANCIAL BREAK EVEN POINT

➤ **MEANING:** It denotes the level of earnings, at which a Firm's EBIT is just sufficient to cover Interest, Tax and Preference Dividend. In other words, there is no Residual Earnings available to Equity Shareholders. In simple words, it is the EBIT at which EPS is zero.

➤ **FORMULA:** Financial Break Even Point is given by the formula:

$$\text{EBIT} = \text{Interest Charges} + \frac{\text{Preference dividend}}{(100\% - \text{Tax Rate})}$$

➤ **SIGNIFICANCE:**

a) A Firm which is able to generate EBIT above the Financial BEP will be able to meet the expectations of the Equity Shareholders and maximize the value / wealth.

b) Financial BEP represents the minimum amount that the Firm has to earn, in order to generate any surplus for Equity Shareholders. Hence, the objective of the Firm must be to generate EBIT above the Financial BEP.

PROBLEM NO 4: X Ltd is considering the following two alternatives

Particulars	Plan I	Plan II
	Amount (Rs.)	Amount (Rs)
Equity Shares of Rs.10 /- each	4,00,000	4,00,000
12 % Debentures	2,00,000	-
Preference Shares of Rs.100/- each	-	2,00,000
	6,00,000	6,00,000

The indifference point between the plans is Rs.2, 40,000. Corporate Tax rate is 30% .Calculate the rate of Dividend of Preference Shares.

(B) (OLD PM) (ANS: 8.40%)

(SOLVE PROBLEM NO. 4 OF ASSIGNMENT PROBLEMS AS REWORK)

Note: _____

PROBLEM NO 5: (PRINTED SOLUTION AVAILABLE) Excel Limited is considering three financing plans. The key information is as follows:

a) Total investment to be raised: Rs.4,00,000.

b) Financing plans

Plans	Equity (%)	Debt (%)	Preference (%)
A	100	—	—
B	50	50	—
C	50	—	50

c) Cost of debt 8 per cent; cost of preference shares 8 per cent.

d) Tax rate is 50 per cent.

e) Equity shares of the face value of Rs.10 each will be issued at a premium of Rs.10 per share.

f) Expected EBIT Rs.1,60,000.

Determine for each plan:

i) Earnings per share (EPS) and financial break-even point.

ii) COMPUTE the EBIT range among the plans A and C for point of indifference. (A) (MTP1 M18 (N) - 10M),(RTP N19 (O))

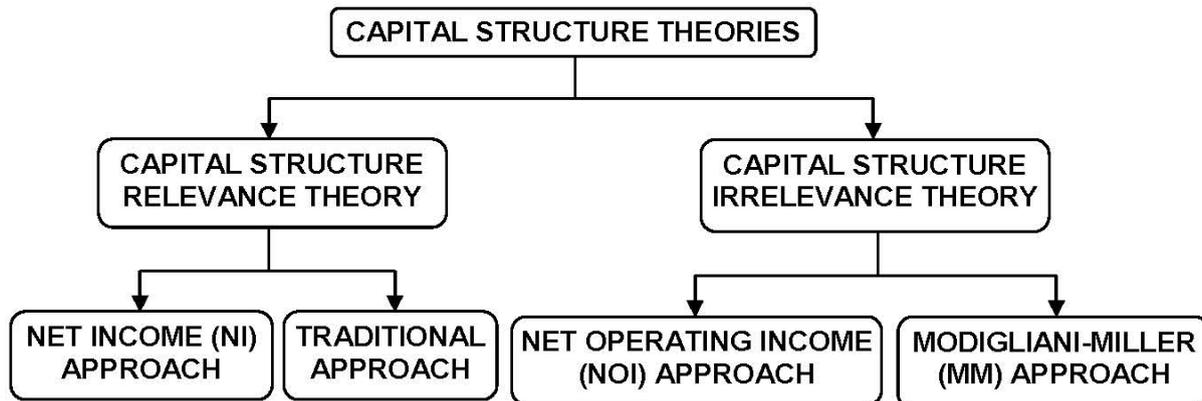
(ANS.: I. EPS FOR PLAN A IS RS. 4, PLAN B IS RS. 7.2, PLAN C IS RS. 6.4 & FINANCIAL BREAK EVEN POINT FOR PLAN A IS RS. 0, PLAN B IS RS. 16,000, PLAN C IS RS. 32,000, II. POINT OF INDIFFERENCE BETWEEN A & C IS RS. 64,000)

(SOLVE PROBLEM NO. 5 OF ASSIGNMENT PROBLEMS AS REWORK)

Note: _____

MODEL 3: CAPITAL STRUCTURE THEORIES

The following approaches explain the relationship between cost of capital, capital structure and value of the firm:



However, the following assumptions are made to understand this relationship.

- There are only two kinds of funds used by a firm i.e. debt and equity.
- The total assets of the firm are given. The degree of Leverage can be changed by selling debt to purchase shares or selling shares to retire debt.
- Taxes are not considered.
- The payout ratio is 100%.
- The firm's total financing remains constant.
- Business risk is constant over time.
- The firm has perpetual life.

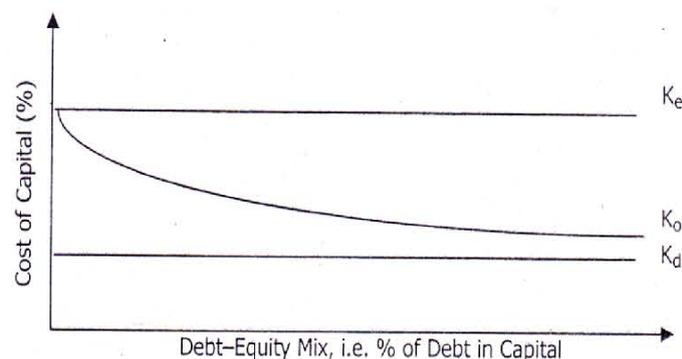
MODEL 3.1: NET INCOME APPROACH (NI-APPROACH)

NET INCOME APPROACH IS BASED ON THE FOLLOWING THREE ASSUMPTIONS:

- a) There are no corporate taxes.
- b) The cost of debt is less than cost of equity or equity capitalisation rate.
- c) The use of debt content does not change the risk perception of Equity investors as a result both the k_d (debt capitalisation rate) and k_e (equity - capitalisation rate) remains constant.

IMPLICATION OR CONCLUSION:

- The Firm can increase its value and lower its K_0 (WACC) by increasing the proportion of debt in the capital structure.
- Thus, Net Income Approach suggests the use of maximum possible debt financing, for minimizing the cost of capital.
- Value of the Firm will be maximum at a point where WACC is minimum, i.e. point of maximum debt.



STEPS: The application of Net Income Approach for determining WACC involves the following Steps:

STEPS	PROCEDURE
1	Determine EBIT (Net Operating Income) and EBT (Net Income). $EBT = EBIT \text{ less Interest on Debt Funds.}$
2	Compute Market Value of Equity (E) = $EBT / \text{Cost of Equity} = EBT / K_e$
3	Compute Market Value of Debt (D) = $\text{Interest} / \text{Cost of Debt} = \text{Interest} / K_d$
4	Compute Market Value of Firm (V) = $E + D = \text{Market Value of Equity} + \text{Market Value of Debt.}$
5	Compute Overall Cost of Capital (K_o) = $EBIT / \text{Value of Firm}$

PROBLEM NO 6: A company's expected net operating income (EBIT) is Rs.50,000. The company has Rs.2,00,000, 10% debentures. The equity capitalisation rate (K_e) of the company is 12.5 %. Find out value of firm and overall cost of capital. Also find out effect on value of firm and overall cost of capital under the following alternatives.

- The firm has decided to raise the amount of debenture by Rs.1,00,000 and use the proceeds to retire the equity shares - State the implications?
- The amount of debt has been reduced by Rs. 1,00,000 and a fresh issue of equity shares is made to retire the Debentures State the implications?

(A) (ANS.: A. AS THE PROPORTION OF DEBT INCREASE HAS DECREASED FROM 11.36% TO 10.87% & AS A RESULT OF M.V OF THE FIRM HAS INCREASED FROM RS.4,40,000 TO RS.4,60,000, B. AS THE PROPORTION OF DEBT DECREASE HAS INCREASED FROM 11.36% TO 11.90% & AS A RESULT OF M.V OF THE FIRM HAS INCREASED FROM RS.4,40,000 TO RS.4,20,000)

(SOLVE PROBLEM NO. 2 OF ASSIGNMENT PROBLEMS AS REWORK)

Note: _____

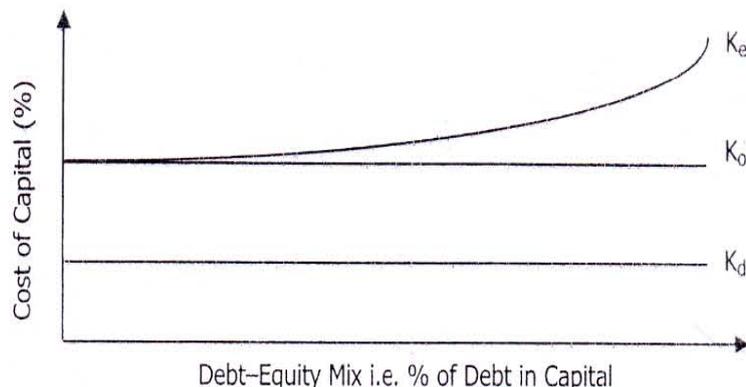
MODEL 3.2: NET OPERATING INCOME (NOI) APPROACH

THE NET OPERATING INCOME APPROACH IS BASED ON THE FOLLOWING ASSUMPTIONS:

- The overall cost of capital remains constant for all degree of debt equity mix.
- The market capitalizes the value of firm as a whole. Thus the split between debt and equity is not important.
- The cost of debt is constant.

IMPLICATION OR CONCLUSION:

- According to this approach, the use of less costly debt funds increases the risk of shareholders. This causes the equity capitalisation rate to increase.
- Thus, the advantage of debt is set off exactly by increase in equity capitalisation rate.
- Due to set-off of low K_d advantage vs. increasing K_e disadvantage, the Overall Cost of Capital (K_o) remains constant for all degrees of Debt-Equity mix.
- Since WACC is constant at all levels, every debt-equity mix is as good as any other mix. There is no optimum capital structure. Every capital structure is optimal one.



STEPS	PROCEDURE
1	Determine EBIT (Net Operating Income) and EBT (Net Income). EBT = EBIT less Interest on Debt Funds.
2	Compute Market Value of Firm (V) = $EBIT / WACC = EBIT / K_o$
3	Compute Market Value of Debt: (D) = $Interest / Cost\ of\ Debt = Interest / K_d$
4	Compute Market Value of Equity (E) = $V - D = \text{Market Value of Firm (Less) Market Value of Debt.}$
5	Compute Cost of Equity Capital (K_e) = $EBT / \text{Value of Equity} = EBT / E$

Note: Under Net Income Theory, the approach is $V = F + D$, in order to compute K_o However, under Net Operating Income Theory, the approach is $E = V - D$, in order to compute K_e

PROBLEM NO 7: (PRINTED SOLUTION AVAILABLE) Operating income of Rs.50,000, Cost of debt 10% and outstanding debt Rs.2,00,000. If the overall capitalisation rate (overall cost of capital) is 12.5%. Find out the effect on value of firm and cost of equity under the following alternatives

- The firm increases the amount of debt from Rs.2,00,000 to Rs.3,00,000 and uses the proceeds of the debt to repurchase equity shares - State the implications?
- The firm retires debt by Rs.1,00,000 by issuing fresh equity shares of the same amount - State the implications.

(A) (ANS.: A. RS. 4,00,000 & 15%, B. COST OF EQUITY SHARE CAPITAL HAS INCREASED FROM 15% TO 20% & M.V OF EQUITY HAS DECREASED FROM 2,00,000 TO 1,00,000.) (SOLVE PROBLEM NO. 7 OF ASSIGNMENT PROBLEMS AS REWORK)

Note: _____

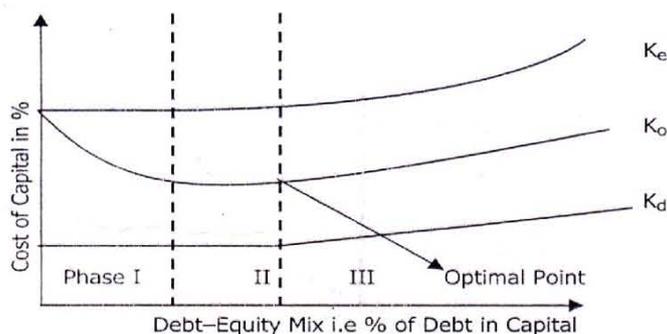
MODEL 3.3: TRADITIONAL APPROACH

DIFFERENT PHASES OF TRADITIONAL THEORY

PHASE	I	II	III
K_d	Constant	Constant	Increases gradually.
K_e	Constant	Increases	Increases faster than K_d
K_o	Declines	Declines and may remain constant	Increases
Reason for K_o movement	Low Cost K_d pulls down K_o	Advantage of Low Cost K_d is set-off by increase in K_e	K_d and K_e both increase, causing K_o to increase.

IMPLICATION OR CONCLUSION:

- Debt is a cheaper source of finance than equity due to tax saving effect and investor's risk expectations. Use of cheaper debt funds in total capital structure will reduce K_o initially. This is because benefit of cheaper debt is larger than increase in cost of Equity. **(STAGE - 1)**
- If more debt is employed, the risk perceptions of Equity Investors and K_e may increase. However, K_d may still remain constant; causing WACC to remain constant due to set-off effect, i.e. advantage of low-cost debt is set-off exactly by the disadvantage of increasing cost of equity. **(STAGE - 2)**
- As debt content further increases, the Firm's financial risk increases, causing increase in the expectations of Equity Investors and therefore a rise in the Cost of Equity Capital (K_e). Moreover additional loans can be taken only at a higher rate of interest. So Cost of Debt K_d also rises beyond a certain level of debt content. **(STAGE - 3)**
- The Firm should strive to reach the optimal capital structure and maximize its total value through a judicious use of both debt and equity in the capital structure. At the optimal capital structure, the overall cost of capital will be minimum and the value of the Firm is maximum.



PROBLEM NO 8: M/s. Navya Corporation has a capital structure of 40% debt and 60% equity. The company is presently considering several alternative investment proposals costing less than Rs.20 lakhs. The corporation always raises the required funds without disturbing its present debt equity ratio.

The cost of raising the debt and equity are as under:

Project cost	Cost of debt	Cost of equity
Upto Rs.2 lakhs	10%	12%
Above Rs.2 lakhs & upto to Rs.5 lakhs	11%	13%
Above Rs. 5 lakhs & upto Rs.10 lakhs	12%	14%
Above Rs.10 lakhs & upto Rs.20 lakhs	13%	14.5%

Assuming the tax rate at 50%, CALCULATE:

- Cost of capital of two projects X and Y whose fund requirements are Rs.6.5 lakhs and Rs. 14 lakhs respectively.
- If a project is expected to give after tax return of 10%, Determine under what conditions it would be acceptable? (A) (SIMILAR: RTP N18(N))

(ANS.: (I) 10.8%, 11.3%(II) IT WOULD BE ACCEPTABLE PROVIDED ITS PROJECT COST DOES NOT EXCEED RS. 5 LAKHS)
(SOLVE PROBLEM NO. 8 OF ASSIGNMENT PROBLEMS AS REWORK)

Note: _____

MODEL 3.4: MODIGLIANI AND MILLER APPROACH-WITHOUT CORPORATE TAXES

IT IS BASED ON THE FOLLOWING ASSUMPTIONS:

- The overall cost of capital remains constant for all degree of debt equity mix.
- The market capitalizes the value of firm as a whole. Thus the split between debt and equity is not important.
- The cost of debt is constant.

This Approach is a refinement of Net Operating Income Approach. The basic theory is essentially same, but some additional propositions are made.

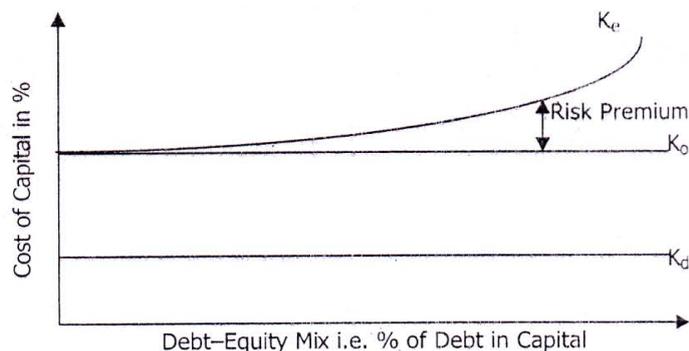
PROPOSITIONS: Modigliani and Miller make the following propositions -

- The Total Market Value of a Firm and its Cost of Capital are independent of its Capital structure.
- The Total Market Value of the Firm is given by capitalising the expected stream of operating earnings (i.e. Net Operating Income) at a discount rate considered appropriate for its risk class.
- The Cost of Equity (K_e) is equal to Capitalisation Rate of Pure Equity Stream plus a premium for Financial Risk.
- The Financial Risk increases with more debt content in the capital structure. As a result, K_e increases in such a manner as to off-set exactly the use of less expensive source of debt funds.

$$\text{Cost of Equity} = \text{WACC} + \text{Risk Premium. So, } K_e = K_o + \frac{\text{Debt}}{\text{Equity}} (K_o - K_d)$$

- The cut off rate for investment purposes is completely independent of the mode of financing. Hence every investment proposal can be evaluated at the rate applicable for such type of Firms. Debt-Equity Mix is not relevant for Capital Budgeting decisions.

MODIGLIANI AND MILLER APPROACH



PROBLEM NO 9: The following information is available regarding the Mid-Air Enterprises:

1. Mid-Air currently has no debt, it is an all-equity company;
2. Expected EBIT = Rs.24 lakhs. EBIT is not expected to increase overnight, so Mid-Air is in a no-growth situation;
3. Mid-Air pays out all of its income as dividends;
4. If Mid-Air begins to use debt, it can borrow at the rate $k_d = 8$ percent. This borrowing rate is constant and it is independent of the amount of debt used. Any money raised by selling debt would be used to retire common stock, so Mid-Air assets would remain constant;
5. The risk of Mid-Air's assets, and thus its EBIT, is such that its shareholders require a rate of return $K_e = 12\%$, if no debt is used.

Using MM Model without corporate taxes and assuming a debt of Rs.1 crore, you are required to: (a) Determine the firm's total market value; (b) Determine the firm's value of equity; (c) Determine the firm's leverage cost of equity.

(A) (SIMILAR: NOV 18(N)) (ANS: (A) RS. 2 CR, (B) RS. 1 CR, (C) 16%)
(SOLVE PROBLEM NO. 9 OF ASSIGNMENT PROBLEMS AS REWORK)

Note: _____

MODEL 3.5: MODIGLIANI AND MILLER APPROACH-WITH CORPORATE TAXES

PROBLEM NO 10: There are two firm's P and Q which are identical except P does not use any debt in its capital structure while Q has Rs.8,00,000, 9% debentures in its capital structure. Both the firms have Earning Before Interest and Tax of Rs.2,60,000 p.a. and the capitalization rate is 10%. Assuming the corporate tax rate of 30%, calculate the value of these firms according to MM Hypothesis.

(A) (OLD PM, SIMILAR: NOV 18 (N)) (ANS.: P IS Rs.18,20,000 & Q IS Rs.20,60,000)

(SOLVE PROBLEM NO. 10 OF ASSIGNMENT PROBLEMS AS REWORK)

Note: _____

PROBLEM NO 11: (PRINTED SOLUTION AVAILABLE) RES Ltd. is an all equity financed company with a market value of Rs.25,00,000 and cost of equity $K_e = 21\%$. The company wants to buyback equity shares worth Rs.5,00,000 by issuing and raising 15% perpetual debt of the same amount. Rate of tax may be taken as 30%. After the capital restructuring and applying MM Model (with taxes), you are required to calculate:

- i) Market value of RES Ltd.

- ii) Cost of Equity (K_e).
- iii) Weighted Average cost of Capital and comment on it.

(A) (OLD PM, RTP N18 (N&O)) (ANS.: (I) 26,50,000, (II) 22%, (III) 19.80%)
(SOLVE PROBLEM NO. 11 OF ASSIGNMENT PROBLEMS AS REWORK)

Note: _____

ASSIGNMENT PROBLEMS

MODEL 1: EBIT - EPS ANALYSIS

PROBLEM NO 1: M/s Punjab Scooters Ltd. has currently an ordinary share capital of Rs. 40 lakhs, consisting of 40,000 shares of Rs. 100 each. The management is planning to raise another Rs. 40 lakhs to finance a major programme of expansion through one of the four possible financing plans. The options are:

- Further issue of 40,000 equity shares of Rs. 100 each.
- Issue of 20,000 equity shares of Rs. 100 each (Rs. 20 lakhs) and the balance Rs. 20 lakhs through long term borrowings at 9% rate of interest per annum.
- Issue of 10,000 equity shares of Rs. 100 each (Rs. 10 lakhs) and the balance Rs.30 lakhs through long term borrowings at 10% rate of interest per annum.
- Issue of 20,000 equity shares of Rs. 100 each (Rs. 20 lakhs) and 20,000 preference shares of Rs.100 each with 7.5% dividend (Rs.20 lakhs).

You are required to advise the management of the company about the best alternative with earnings per share (EPS) in each alternative. The company's EBIT will be Rs. 15 lakhs and the corporate tax rate is 50%.

(B) (ANS.: EPS FOR OPTION A IS RS. 9.375, OPTION B IS RS. 11, OPTION C IS RS. 12, AND OPTION D IS RS.10)(Similar to MTP NOV 19(N))

PROBLEM NO 2: Paramount Products Ltd. wants to raise Rs.100 lakhs for a diversification project. Current estimate of earnings before interest and taxes (EBIT) from the new projects is Rs. 22 lakhs per annum. Cost of debt will 15% for amounts up to and including Rs. 40 lakhs, 16% for additional amounts up to and including Rs. 50 lakhs and 18% for additional amounts above Rs. 50 lakhs. The equity shares (face value Rs.10) of the company have a current market value of Rs. 40. This is expected to fall to Rs. 32 if debts exceeding Rs.50 lakhs are raised. The following options are under consideration of the Company:

Option	Equity	Debt
I	50%	50%
II	60%	40%
III	40%	60%

Determine the earning per share (E.P.S.) for each option and state which option the company should exercise. Tax rate applicable to the company is 50%.

(A) (ANS.: EPS FOR OPTION-I IS RS.5.76, OPTION-II IS RS.5.33, OPTION-III IS RS.5.04 & OPTION-I IS MOST SUITABLE TO MAXIMIZE THE EARNINGS PER SHARE)

PROBLEM NO 3: The existing capital structure of XYZ Ltd. is as under:

Particulars	Rs.
Equity shares of Rs. 100 each	40,00,000
Retained earnings	10,00,000
9% preference share of Rs. 100 each	25,00,000
7% debentures of Rs. 100 each	25,00,000

The existing rate of return on the company's capital is 15% and the income-tax rate is 40%. The company requires a sum of Rs.50,00,000 to finance its expansion program for which it is considering the following alternatives: Issue of 25,000 equity shares at a premium of Rs.100 per share Or Issue of 12% preference shares or Issue of 10% debentures. It is estimated that the PE ratio in the cases of Equity, Preference and Debenture financing would be 25, 20 and 15 respectively. Which of the above alternatives would you recommend? (A)

(ANS.: MARKET PRICE (EPS X PE RATIO) FOR OPTION-I IS RS.392.25, OPTION-II IS RS.210, OPTION-III IS RS.270 & SINCE MARKET PRICE IS HIGH IN OPTION I, IT IS BENEFICIAL TO RAISE THE FUNDS OF RS. 50,00,000 BY WAY OF FRESH EQUITY SHARES)

MODEL 2: INDIFFERENCE POINT / EPS EQUIVALENCY POINT

PROBLEM NO 4: Y Ltd. is considering the following two alternative financing plans:

Particulars	Plan I	Plan II
	Amount (Rs.)	Amount (Rs)
Equity Shares of Rs.100 /- each	8,00,000	6,00,000
Debentures	2,00,000	-
10% Preference Shares of Rs.100/- each	-	4,00,000
	10,00,000	10,00,000

The indifference point between the plans is Rs.2,72,000. Corporate Tax rate is 50% .Calculate the rate of Interest for Debentures. (B) (ANS: 8%)

PROBLEM NO 5: The management of Z Company Ltd. wants to raise its funds from market to meet out the financial demands of its long-term projects. The company has various combinations of proposals to raise its funds. You are given the following proposals of the company:

Proposals	% of Equity	% of Debts	% of Preference shares
P	100	-	-
Q	50	50	-
R	50	-	50

- Cost of debt - 10%, Cost of preference shares - 10%
- Tax rate - 50%
- Equity shares of the face value of Rs. 10 each will be issued at a premium of Rs. 10 per share.
- Total investment to be raised Rs. 40,00,000.
- Expected earnings before interest and tax Rs. 18,00,000.

From the above proposals the management wants to take advice from you for appropriate plan after computing the following:

- Earnings per share
- Financial break-even-point
- Compute the EBIT range among the plans for indifference. Also indicate if any of the plans dominate.

(A) (OLD PM) (ANS.: EPS FOR P IS RS. 4.5, Q IS RS. 8, R IS RS. 7 & FINANCIAL BREAK-EVEN POINT P IS 0, Q IS 2,00,000, Q IS 4,00,000; COMBINATION P&Q 4,00,000, P&R 8,00,000, Q&R- No In-difference Point)

MODEL 3.1: NET INCOME APPROACH (NI-APPROACH)

PROBLEM NO 6: Rupa Company's EBIT is Rs.5,00,000. The company has 10%, 20 lakh debentures. The equity capitalization rate i.e. K_e is 16%.

You are required to calculate under NI Approach:

- Market value of equity and value of firm
- Overall cost of capital

(B) (NEW SM, OLD SM) (ANS.: A. RS. 38,75,000 & 12.9%)

MODEL 3.2: NET OPERATING INCOME (NOI) APPROACH

PROBLEM NO 7: Anitha Ltd's operating income is Rs.5,00,000. The firm's cost of debt is 10% and currently the firm employs Rs.15, 00,000 of debt. The overall cost of capital of the firm is 15%.

You are required to determine using NOI approach:

- a) Total value of the firm b) Cost of equity (B) (NEW SM, OLD SM) (ANS.: A. RS. 33,33,333 & B. 19.09%)

MODEL 3.3: TRADITIONAL APPROACH

PROBLEM NO 8: M/s Mini & Fine Ltd. are analysing the most desirable capital structure. Following are the estimates of the cost of debt and equity capital (after tax) at various levels of debt equity mix.

Debt as a percentage of total Capital employed	Cost of debt (%)	Cost of equity (%)
0	6.0	11.5
10	6.0	12.0
20	6.0	12.0
30	6.5	13.0
40	7.0	15.0
50	7.5	17.0
60	8.0	20.0

You are required to determine the optimal debt-equity mix for the company by calculating composite cost of capital. (A) (ANS.: THE WACC IS MINIMUM 20% OF DEBT AND 80% EQUITY REPRESENTS OPTIMUM CAPITAL STRUCTURE)

MODEL 3.4: MODIGLIANI AND MILLER APPROACH - WITHOUT CORPORATE TAXES

PROBLEM NO 9: Gamma Limited and Delta Limited are identical except for capital structures. Gamma has no debt, whereas Delta has 40 percent debt and 60 percent equity. (All percentages are in market-value terms). The borrowing rate for both companies is 10 percent in a no-tax world, and capital markets are assumed to be perfect.

- a) If your own 3 percent of the stock of Gamma, what is your return if the company has net operating income of Rs.6,00,000 and the overall capitalisation rate of the company, K_0 is 20 percent? (ii) What is the implied required rate of return on equity?
- b) Delta has the same net operating income as Gamma. (i) What is the implied required equity return of Delta? (ii) Why does it differ from that of Gamma?

(ANS.: A. (I) RS. 18,000 (II) 20% B. 26.67% IMPLIED REQUIRED RATE OF RETURN ON EQUITY IS LESS IN THE CASE OF DELTA BECAUSE IT USED LESS DEBT IN THE CAPITAL STRUCTURE)

MODEL 3.5: MODIGLIANI AND MILLER APPROACH-WITH CORPORATE TAXES

PROBLEM NO 10: A Ltd. and B Ltd. are identical in every respect except capital structure. A Ltd. does not employ debts in its capital structure whereas B Ltd. employs 12% Debentures amounting to Rs.10 lakhs.

Assuming that:

- i) All assumptions of MM model are met;
- ii) Income-tax rate is 30%;
- iii) EBIT is Rs.2,50,000 and
- iv) The Equity capitalization rate of 'A' Ltd. is 20%.

Calculate the value of both the companies and also find out the Weighted Average Cost of Capital for both the companies. (A) (OLD PM, MTP1 M18 (N) - 5M) (ANS: (I) 11,75,000 (II) WACC = 14.90%)

PROBLEM NO 11: Stopgo Ltd, an all equity financed company, is considering the repurchase of Rs. 200 lakhs equity and to replace it with 15% debentures of the same amount. Current market Value of the company is Rs. 1140 lakhs and it's cost of capital is 20%. It's Earnings before Interest and Taxes (EBIT) are expected to remain constant in future. It's entire earnings are distributed as dividend. Applicable tax rate is 30 per cent.

You are required to calculate the impact on the following on account of the change in the capital structure as per Modigliani and Miller (MM) Hypothesis:

- The market value of the company
- Its cost of capital, and
- Its cost of equity

iv) (M18 (N) - 10M) (ANS.: I) MV: RS. 1,200 LAKHS; II) COST OF CAPITAL: 19%, III) COST OF EQUITY: 20.7%

PRINTED SOLUTIONS TO SOME SELECTIVE PROBLEMS

PROBLEM NUMBERS TO WHICH SOLUTIONS ARE PROVIDED: 1, 3, 5, 7, 11.

PROBLEM NO. 1

Step 1: Calculation of EAESH

(Rs. In Lakhs)

Particulars	Existing	Option-I (Equity shares)	Option-II (Debt)	Option-III (Equity + Debt)
Estimated EBIT	60	100	100	100
Less: Interest	-	-	(8)	(4)
EBT	60	100	92	96
Less: Tax @ 50%	30	50	46	48
PAT / EAESH	30	50	46	48

Step 2: Finding out number of Equity shares

No. of equity shares (lakhs of shares)	Existing	Option-I (Equity shares)	Option-II (Debt)	Option-III (Equity + Debt)
- Existing	10	10	10	10
- New issued	-	2	-	0.50
Total Shares	10	12	10	10.5

Step 3: Calculation of EPS

EPS = $\frac{\text{PAT}}{\text{No. of equity shares}}$	Rs.3	Rs.4.16	Rs.4.6	Rs.4.57

Decision: Option-II. i.e., issue of 16% debentures is most suitable to maximize the Earnings Per Share.

PROBLEM NO.3

Evaluation of the given two modes of financing the additional funds:

Particulars	Option 1	Option 2
EBIT (17,00,000 X 20%) (W.N.-1 & 2)	3,40,000	3,40,000
Less: Interest		
- Existing	60,000	60,000
- New	28,000 (2,00,000 × 14%)	---
EBT	2,52,000	2,80,000
Less: Tax @ 35%	88,200	98,000
EAT/EAESH (A)	1,63,800	1,82,000
No. of equity shares - Existing	40,000	40,000
- New	-	5,128 (2,00,000 / 39)
Total number of equity shares (B)	40,000	45,128
EPS (A/B)	4.095	4.033
PE ratio (W.N.-3)	8	10
Market price	32.76	40.33

Conclusion: The objective of Financial Management is to maximize the benefits of equity shareholders. Since market price is high in option II, it is beneficial to raise the funds of Rs.25,00,000 by way of fresh equity shares.

W.N-1: Calculation of existing capital employed

Equity share capital (40,000 shares X Rs.10)	4,00,000
Retained earnings	6,00,000
12% debentures $\left(\frac{60000}{12\%}\right)$	5,00,000
Total capital employed (existing)	15,00,000

Total capital employed after expansion = Rs.15,00,000 + Rs.2,00,000

W.N-2: Existing Return on investment (ROI) = $\frac{\text{EBIT}}{\text{Capemployed}} \times 100 = \frac{3L}{15L} \times 100 = 20\%$

Given that the additional investment of Rs.2,00,000/- will also yield the same rate of return.

W.N-3: Calculation of Debt Equity ratios & P/E ratio in different situations

Debt equity ratio under existing capital structure = $\frac{\text{Debt}}{\text{Debt+Equity}} = \frac{5L}{15L} \times 100 = 33.33\%$

Debt equity ratio when required funds are raised through debt = $\frac{7L(5+2)}{17L} \times 100 = 41.2\%$

In this case, since the debt equity ratio is greater than 35%, PE ratio will fall down to 8 & cost of debt will increase to 14%.

Debt equity ratio when required funds are raised through equity = $\frac{5L}{17L} \times 100 = 29.4\%$

In this case, since the debt equity ratio is less than 35%, PE ratio will remain to be same 10 & cost of debt will increase to 14%.

PROBLEM NO.5

i) Calculation of EPS in each of the financial plans and calculation of financial breakeven point.

Particulars	Plan A	Plan B	Plan C
EBIT	1,60,000	1,60,000	1,60,000
Less: Interest on debt @ 8%	-	(16,000)	-
EAT	1,60,000	1,44,000	1,60,000
Less: Tax @ 50%	(80,000)	(72,000)	(80,000)
EAT/EASH	80,000	72,000	80,000
Less: Preference dividend	-	-	16,000
EAESH (A)	80,000	72,000	64,000
No. of equity shares (B)	20,000 (4,00,000 / 20)	10,000 (2,00,000 / 20)	10,000 (2,00,000 / 20)
EPS (A/B)	Rs.4.00	Rs.7.20	Rs.6.40

ii) Financial Break-even Point for Each Plan

Plan A: There is no fixed financial charges, hence the financial break-even point for Plan A is zero.

Plan B: Fixed interest charges is Rs.16,000, hence the financial break-even point for Plan B is Rs.16,000

Plan C : Fixed charge for preference dividend is Rs.16,000, hence, the financial break-even point for Plan C is Rs.16,000/ (1-0.5) = Rs.32,000

iii) Indifference point between Plan A and C:

$$\frac{(X-0)(1-0.5)-0}{20,000} = \frac{(X-0)(1-0.5)-16,000}{10,000}$$

$$\frac{0.5X}{20,000} = \frac{0.5X-16,000}{10,000}$$

$$0.5X = 2(0.5X - 16,000)$$

$$X - 0.5X = 32,000$$

$$X = \text{Rs. } 64,000$$

Thus point of indifference between plan A and C is Rs. 64,000.

PROBLEM NO: 7

a) **Profit Statement:**

Particulars	Point (a)	Point (b)
		Amount
EBIT	50,000	50,000
Less: Interest	20,000 (2,00,000 x 10%)	30,000
EAESH	30,000	20,000

Point (a)

$$\text{M.V. of firm} = \frac{\text{EBIT}}{K_o} = \frac{50,000}{0.125} = 4,00,000/-$$

$$\begin{aligned} \text{M.V of Equity} &= \text{M.V of Firm} - \text{M.V of Debt} \\ &= 4,00,000 - 2,00,000 = 2,00,000 \end{aligned}$$

$$\begin{aligned} \text{Cost of Equity (K}_e) &= \frac{\text{EAESH}}{\text{M.V of Equity}} = \frac{30,000}{2,00,000} \\ &= 0.15 = 15\% \end{aligned}$$

Point (b)

$$\text{M.V of Debt} = 3,00,000$$

$$\text{M.V of Equity} = 1,00,000$$

$$\text{M.V of Firm} = 4,00,000$$

$$\text{Cost of Equity (K}_e) = \frac{20,000}{1,00,000} = 20\%$$

Implications:

1. Cost of Equity share capital has increased from 15% to 20%.
2. M.V of Equity has decreased from 2,00,000 to 1,00,000.

PROBLEM NO. 11

Computation of market value, cost of Equity and WACC of RES Ltd:

Market value of Equity = 25,00,000

$K_e = 21\%$

$$\frac{\text{Net income (NI) for equity holders}}{K_e} = \text{Market value of equity}$$

$$\frac{\text{Net income (NI) for equity holders}}{0.21} = 25,00,000$$

Net income for equity holders = 5,25,000

EBIT = 5,25,000 / 0.7 = 7,50,000

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	All equity	Debt and Equity
EBIT	7,50,000	7,50,000
Interest to debt - holders	-	75,000
EBT	7,50,000	6,75,000
Tax (30%)	2,25,000	2,02,500
Income available to equity shareholders	5,25,000	4,72,500
Income to debt holders plus income available to shareholders	5,25,000	5,47,500

Present value of tax - shield = $5,00,000 \times 0.30 = 1,50,000$

i) Value of Restructured firm = $25,00,000 + 1,50,000 = 26,50,000$.

ii) Cost of Equity (K_e)

Total Value = 26,50,000

Less: Value of Debt = 5,00,000

Value of equity = 21,50,000

$$K_e = \frac{4,72,500}{21,50,000} = 0.219 = 22\%$$

iii) WACC

Cost of debt (after tax) = $15\% (1-0.3) = 0.15(0.70) = 0.105 = 10.5\%$

Components of costs	Amount	Cost of capital	Weight	Weighted COC
Equity	21,50,000	0.22	0.81	0.178
Debt	5,00,000	0.105	0.19	0.020
	26,50,000			1.198

WACC = 19.8%

Comment: At present company is all equity financed. So, $K_e = K_o$ i.e. 21%. However after restructuring, the K_o would be reduced to 19.81% and K_e would increase from 21%. To 21.98%, Reduction in K_o and increase in K_e is good for health of the company.

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THE END