4 CHAPTER

COST OF CAPITAL

"The secret of success in battle lies often not so much in the use of one's own strength but in the exploitation of the other side's weaknesses"

-Jhon Christopher

CHAPTER OUTLINE

Topic-1
Determination of COC

Topic-2
Cost of Long-Term Debt

Topic-3
Cost of Irredeemable Debentures

Topic-4
Cost of Redeemable Debentures

Topic-5
Cost of Debt using Present value method

Topic-6
Amortisation of Bond

Topic-7
Cost of Convertible Debentures

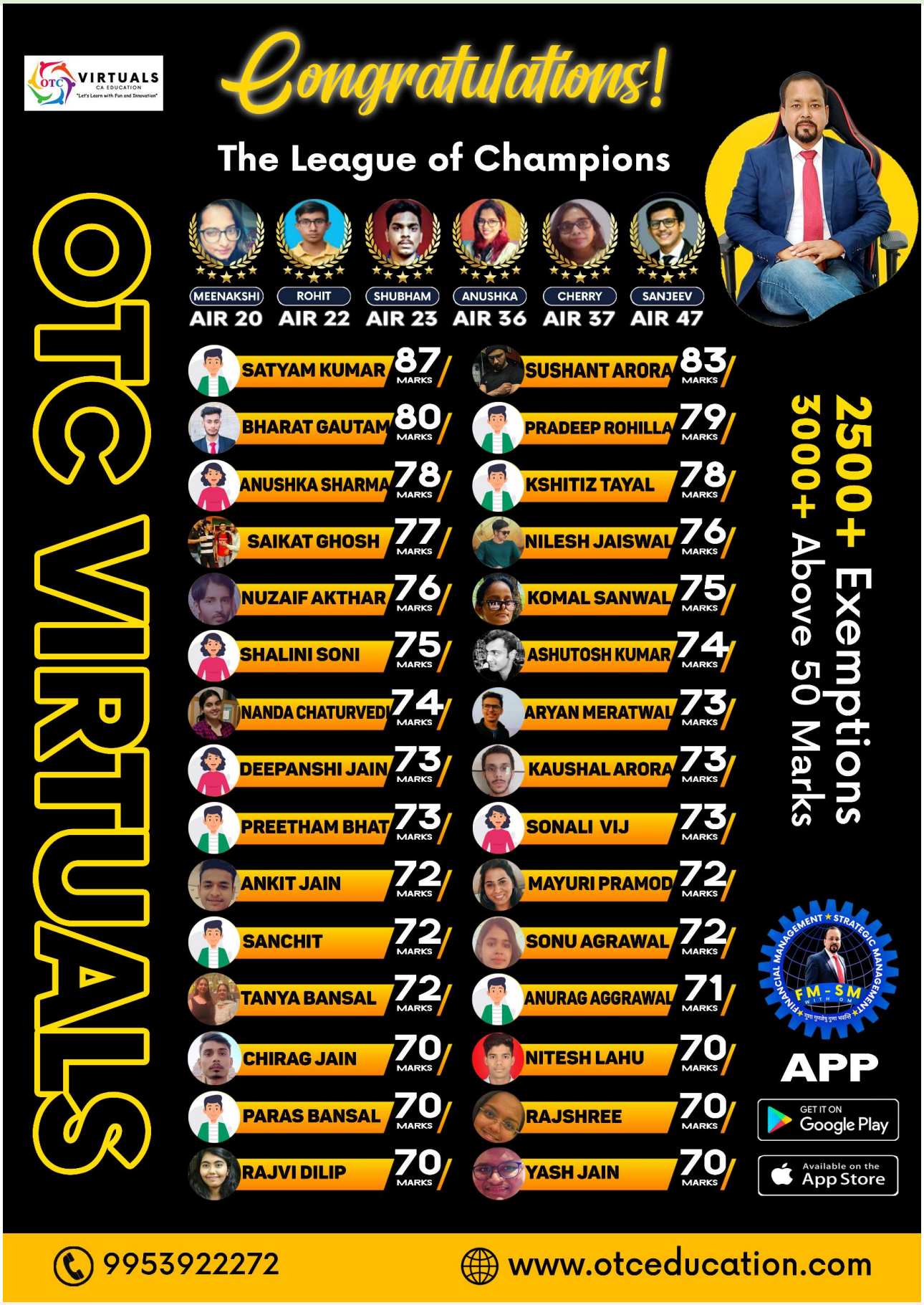
Topic-8
Cost of Preference Share Capital

Topic-9
Cost of Equity Share Capital

Topic-10
Cost of Retained Earnings

Topic-11
Weighted Average Cost of Capital

Topic-12
Marginal Cost of Capital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Cost of Capital - Fundamentals

- ✓ Cost (Percentage) paid to the providers of Capital for using Capital.
- ✓ COC is the "Discount Rate" (As used in TVM or Valuation of Securities).
- ✓ Also Called -
  - Hurdle Rate, Cut-off Rate or Expected or Minimum Rate of Return for stakeholders.
- ✓ Capital of LT Sources of Finance -
  - ➢ Equity (Internal or External) - Dividend
  - ➢ LT Debts (Debentures or Term Loans) - Interest
  - ➢ Preference Share Capital - Dividend

COST OF CAPITAL FUNDAS

FUNDA 1 - Naming of SOF

i. Cost of Equity - K_e
ii. Cost of Retained Earnings - K_r
iii. Cost of Debt - K_d
iv. Cost of Preference Share Capital - K_p

FUNDA 2 - Issue Prices

i. Issued at Par - ₹1, ₹10, ₹100.
i. Issued at Premium - @10% - ₹1.1, ₹11, ₹110.
ii. Issued at Discount - @10% - ₹1.1, ₹11, ₹110.

FUNDA 3 - Redeemable Value

i. Redeemable at Par
ii. Redeemable at Premium
iii. Redeemable at Discount

Query Point If "Question is Silent" on the above, assume that securities are redeemable at par and make it a part of your working note (** Assumption). Reference - Q 5 & P 14.

FUNDA 4 - Floatation Cost (New)

i. Issue Management Cost (CO)
ii. Brokerage
iii. Legal Fees
iv. Underwriting Commission
v. Administrative Charges
vi. Printing Expenses

FUNDA 5 - Net Proceeds

Net Proceeds = Issue Price of Securities (+/- Premium or Discount - Floatation Cost.
Note: Applicable on New Issues & not on Existing/Old Securities (CMP for Existing/Old securities).

FUNDA 6 - CFs for KC Calculation

i. TFs - NP @ Beginning.
ii. OFs - Interest, Dividend, Redemption Value.
iii. TF of Tax benefits.
iv. OF - Payment of Div. Tax.

Query Point In case the Floatation Cost (FC) is given in the question, Current Market Price or Issue Price must be taken after deducting FC, Called Net Proceeds. (** Assumption).

Funda 7 - Interest and Tax Saving due to Interest

Tax savings due to payment of interest leads to extra income for the company.

Savings due to Interest = Interest * Tax Rate
= 20 * 30% = 6

Net Interest Cost to the Co. = 20 - (20 * 30%) = 14

Formula:
Net Interest Cost = Interest * (1 - Tax Rate)
= I * (1 - t)

CI - "पैसे का ना जाना तो आना ही होता है।"
CO - "पैसे का ना आना तो जाना ही होता है।"

Particulars	BTS Army	Black-Pink
Sales	100	100
Less: Interest @ 20%	20	Nil
PBT	80	100
Less: Tax @ 30%	24	30
PAT	56	70
Pref. Dividend @ 20%	Nil	14
Earnings for Equity Shareholders	56	56
Equity Dividend	Nil	06
Retained Earnings	56	50

COST OF CAPITAL - Cost of Long-term Debts (K_d)

FUNDA 8 - Irredeemable Debt

Formula:

$$K_d = \frac{I}{NP}(1-t)$$

FUNDA 9 - Redeemable Debentures

Formula (Approx. Method):

$$(K_d) = \frac{I(1-t) + \frac{(RV-NP)}{n}}{\frac{(RV+NP)}{2}}$$

When debts are issued at discount and/ or redeemed at a premium. If discount on issue and/ or premium on redemption are tax deductible, then -

$$(K_d) = \frac{I + \frac{(RV-NP)}{n}}{\frac{(RV+NP)}{2}}(1-t)$$

Query Point

- ✓ Net proceeds means issue price less issue expenses or floatation cost (defined below).
- ✓ If issue price is not given, then students can assume it to be equal to current market price.
- ✓ If issue expenses are not given, then simply assume it to be equal to zero.
- ✓ (** Assumption). Reference - ICAI - Illustration 1, & 3.

FUNDA 11 - Cost of Plain Vanilla or Conventional Bond (K_d)

- ✓ Constant Interest @ Coupon Rate (CR)
- ✓ Redeemable @ Par, Premium or Discount.

Formula -

- ✓ Same as Cost of Redeemable Debentures - Approx. Method or use YTM or IRR Technique.

FUNDA 12 - Cost of Convertible Debentures (K_d)

Formula -

- ✓ Same as Cost of Redeemable Debentures - Approx. Method or use YTM or IRR Technique.

Redeemable Value (RV)

- ✓ RV of Debenture or Conversion Value, whichever is higher.

FUNDA 13 - Cost of Pref. Share Capital (K_p)

K_p (At Par) = Dividend Rate

K_p for Irredeemable PS = Pref. Dividend/NP * 100

K_p for Redeemable PS =

$$(K_p) = \frac{PD + \frac{(RV-NP)}{n}}{\frac{(RV+NP)}{2}}$$

FUNDA 14 - Cost of Pref. Share Capital (K_p) with Dividend Distribution Tax (DDT/CDT)

K_p (At Par) = Pref. Dividend Rate (1 + CDT)

K_p for Irredeemable PS = Pref. Dividend (1 + CDT) /NP * 100

K_p for Redeemable PS =

$$(K_p) = \frac{PD(1+CDT) + \frac{(RV-NP)}{n}}{\frac{(RV+NP)}{2}}$$

FUNDA 15 - Cost of Term Loan (K_t) *** Market Value of the Term Loan = BV of Term Loan

Option 1 - K_t (%) - Without Floatation Cost

Formula: K_t (%) = I (1-t)

Option 2 - K_t (%) - With Floatation Cost

Formula: K_t (%) = I (1-t)/ 1-FC

Option 3 - K_t (Amount) - Without Floatation Cost

Formula: K_t = Amount of Interest (1-t)/ Loan Amount

Option 4 - K_t (Amount) With Floatation Cost

Formula: K_t = Amount of Interest (1-t)/ Loan Amount - FC

Funda 16 - COC Using YTM/PV/TRR Technique

PV of CI = PV of CO

Step 1 : Identify the relevant CFs

Year	RP
0	CMP
1 - N	Interest (1-t)
N	Redemption Value

Step 2: Trial & Error Method Steps

Year	CFs	PV @ DF (L)	PV @ DF (H)
0	***	***	***
1 - N	***	***	***
N		***	***
NPV		***	***

Step 3: Calculate IRR

$$(IRR = L + \frac{NPV_L}{NPV_L - NPV_H}(H-L)$$

Funda 17 - Cost of Debentures Amortized over a Period

- ✓ Concept Reference - Valuation of Securities.

Example:

15% debt with a FV of 1,000 where FC is 50 redeemable after 5 years through 5 equal instalments of 200 starting end of the year. Rax rate is 30%.

- ✓ Use YTM Technique to solve this Problem.
- ✓ Cash Inflow = Cash Outflow.
- ✓ Trial and Error Method.

Year	RP	Interest	Post Tax CO	Total
Yr. 1	200	150	200+105	305
Yr. 2	200	120	200+84	284
Yr. 3	200	90	200+63	263
Yr. 4	200	60	200+42	242
Yr. 5	200	30	200+21	221

Funda 18 - Cost of Equity (K_e or K_r)

- ✓ Equity or Net Worth = Internal Equity (RE) + External Equity (Shares Issued to ESH)
- ✓ ESH have Last Claim. Higher Risk - However, Required rate of return is higher than K_d, K_p, or K_t.
- ✓ Organizations are supposed to satisfy the expectations of the ESHs.
- ✓ How to judge the expectations of the ESHs? - (RANR = R_fRR + R_fNR + Risk Premium)
- ✓ Internal Equity (RE) - No Floatation Cost
- ✓ External Equity (Shares Issued to ESH) - Floatation Cost can be there, if specified.

Funda 19 - CALCULATION OF COST OF EQUITY (K_e) METHODS

Dividend Price Approach

- ✓ Constant Dividend for ever-Perpetual
- ✓ No RV

$$(K_e) = \frac{D}{P_0}$$

Earnings Price Approach

- ✓ Retained Earnings (RE) belongs to ESHs

$$(K_e) = \frac{E}{P}$$

Growth Approach

2 Methods -

1. Div + Growth
2. Earnings + Growth

$$(K_e) = \frac{D_1}{P_0} + g$$

CAPM Approach

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

R_f = Risk free rate of return

Rm = Rate of return on market portfolio

(R_m - R_f) = Market risk premium

ß = Beta coefficient

Realized Yield Approach

- ✓ Average rate of return realized in the past few years is regarded as 'expected return' in the future.

$$K_e = [(1+Y_1)\times(1+Y_2)\times\cdots(1+Y_n)]^{1/n}-1$$

Funda 20 - Calculation of Growth Rate

CAGR - Compounded Annual Growth Rate (g)

Formula:

$$\text{Current Dividend}(D_0) = D_n(1+g)^n$$

OR

$$\text{Growth rate} = \sqrt[n]{\frac{D_0}{D_n}} - 1$$

Growth Rate (g) as per Gordon Model

Formula: $g = b \times r$

b = Retention Ratio

r = ROE

Funda 21 - Cost of Retained Earnings (K_r)

- ✓ K_r is the opportunity cost of dividends foregone by the ESHs.
- ✓ K_e remains higher than K_r due to Issue Price Lower than CMP & FC.

Dividend Price method: $K_r = \frac{D}{P}$

Earning Price method: $K_r = \frac{EPS}{P}$

Growth method: $K_r = \frac{D_1}{P_0} + g$

Query Point

- ✓ For calculation of K_r : P = CMP. Sometimes issue price may also be used.
- ✓ Floatation cost is not used for the calculation of K_r.

Query Point

- ✓ In case of fresh issue of Equity Shares, Net Proceeds from Equity Share = Issue Price - Issue expenses or FC) in place of CMP.
- ✓ If nothing is mentioned in the question, FC is assumed to be linked with "face value or issue price whichever is higher".

FUNDA 22 - WEIGHTED AVERAGE COST OF CAPITAL

- ✓ WACC of a company depends on the capital structure of a company.
- ✓ WACC is the weighted average after tax costs of the individual components of firm's capital structure.

Steps to Find out OVERALL COC:

Step 1: Calculate the total capital from all the sources of capital.

Step 2: Find out Weights of capital from all the sources. (Book Value, Market Value & Target Weights)

Step 3: Calculate the Cost of different sources of capital. (K_e, K_r, K_d, K_p & K_t)

Step 4: $WACC = W_eK_e + W_rK_r + W_dK_d + W_pK_p + W_tK_t$

PROFORMA STATEMENT FOR WACC

Capital Structure (a)	Amount (b)	Weight (c)	Component Cost (d)	Cost of Capital (e) = c x d
Equity Share Capital	XXX	0.XXX	0.XX	0.XX
Retained Earnings	XXX	0.XXX	0.XX	0.XX
Preference Share Capital	XXX	0.XXX	0.XX	0.XX
Debentures	XXX	0.XXX	0.XX	0.XX
Total	XXX	1.000	WACC	0.XXX

Query Point

- ✓ Market Value of Equity has been apportioned in the ratio of Book Value of Equity and Retained Earnings when Market Value Weights are used.

FUNDA 23 - MARGINAL COST OF CAPITAL (MCC)

- ✓ Cost of raising an additional rupee of capital.
- ✓ Marginal Weights = On the portion of funds the firm intends to employ.
- ✓ The marginal cost of capital should be calculated in the composite sense.
- ✓ MCC is derived, when the average cost of capital is calculated using the marginal weights.

Query Point

- ✓ If the firm raises capital in the same proportion as earlier (BVW, MVW, TW), component costs of capital will remain the same. Therefore, MCC = WACC.

FUNDA 24 - LEVERED VS UNLEVERED FIRMS

WACC of Levered Firm

Formula:

$$WACC = W_eK_e + W_rK_r + W_dK_d + W_pK_p + W_tK_t$$

WACC of Unlevered Firm

Formula:

$$WACC = K_e$$

FUNDA 25 - Treatment of K_e When WACC Is Calculated on MV Weights

Alternative 1	Alternative 2
Take Market Value of Equity and Calculate WACC.	Bifurcate MV of Equity in 2 Parts as per Book Value Weights and Calculate WACC.

*** Note: Any one of the alternatives can be taken into consideration or both the solutions can be presented. However, students must give a "Note on Assumption" in the answer.

Funda 26 - K_e & Treatment of Personal Income Tax

- ✓ Personal Income Tax is an Outflow for the Investors.
- ✓ In this case, we are calculating K_r from Investor's point of view.
- ✓ Therefore, Investor's Return = Cost to the Company

$K_r = K_e$ (1- Personal Income Tax Rate) - Brokerage Rate of Investment.

$K_r = K_e$ (1-tp) - Brokerage.

EXAMPLE

Retained Earnings = ₹ 5,00,000
Expected Return = 15%.
Tax Rate = 30%
Brokerage = 2%.
Calculate Cost of Retained Earnings.

Query of the Day!

Query 1: How to calculate K_d if the Face Value of Debentures equals to Net Proceeds?

Answer: K_d = Rate of Interest (1-t)

Query 2: Which one of the 2 will be taken, convertible value or redemption value, in case of calculation of K_d of convertible debenture?

Answer: In case of calculation of K_d of convertible debenture, convertible value will be taken in the place of redemption value of debenture.

Query 3: What if the question is silent about , issue price, redemption value etc.?

Answer: If nothing is specified in the question like, issue price, redemption value etc. assumed it to be equal to face value.

Query 4: What if nothing is mentioned in the question about linking of FC to FV or Issue Price.?

Answer: If nothing is specified in the question, floatation cost is assumed to be linked with "face value or issue price whichever is higher".

- Note: Answer to Q2, 3 & 4 will remain the same in case of Convertible Preference Shares.

Query 5: How to calculate K_p if the Face Value of Preference Shares equals to Net Proceeds?

Answer: K_p = Rate of Preference Dividend

Query 6: What if the Short term Debt is given in the question?

Answer: It's a part of Current Liability and Not a part of Capital Employed, therefore, IGNORE it.

Query 7: When a company should accept the project?

Answer: Only when, the Return After Tax ≥ Cost of Capita (K_c).

Query 8: When a company should take loans or issue bond?

Answer: Only if K_c is minimum.

Query 9: Which Debt:Equity ratio is optimum?

Answer: Only if K_c is minimum and Return is Maximum.

Query 10: When a company should take loans or issue bond?

Answer: Only if K_c is minimum.

Query 11: Which Debt : Equity ratio is optimum?

Answer: Only if K_c is minimum and Return is Maximum.

Query 12: When question is silent on BV or MV Weights, which ne to be taken?

Answer: You can use any one. However, MV Weights are preferable. Students must give a "Note on Assumption" in the answer.

Query 13: What will be the treatment of RE when nothing is mentioned in the question?

Answer: We assume that it is not available for investment or it has already been invested.

Query of the Day!

Query 14: What is BASIS POINT?

Answer: rate of Interest - Example: 100 Basis Point = 1% or 200 Basis Point = 2%

Query 15: AS PER ICAI QUESTIONS - When to use When to use CMP and When to use NP?

Answer: This depends upon Question to Question.

i. In case of Old or Existing Issues = CMP

ii. New Issue with FC = NP (Issue Price - FC)

iii. If Question is Silent = NP (As CMP to be considered as Issue Price)

iv. In all the above cases write a "Note on Assumption" in the answer.

Query 16: Whether we should apply FC on FV/CMP/Issue Price?

Answer:

i. AS PER ICAI - Apply on CMP or Issue Price on case to case basis.

ii. If question is silent, Apply on Any of the 3.

iii. In all the above cases write a "Note on Assumption" in the answer.

Query 17: Dividend is paid upon which Value?

Answer: Dividend is paid upon Face Value of the Shares.

Query 18: which dividend is taken into account while calculating K_e - At beginning or end of the year?

Answer: Dividend paid at the end of the year - D1 or DPS1 is taken into calculation.


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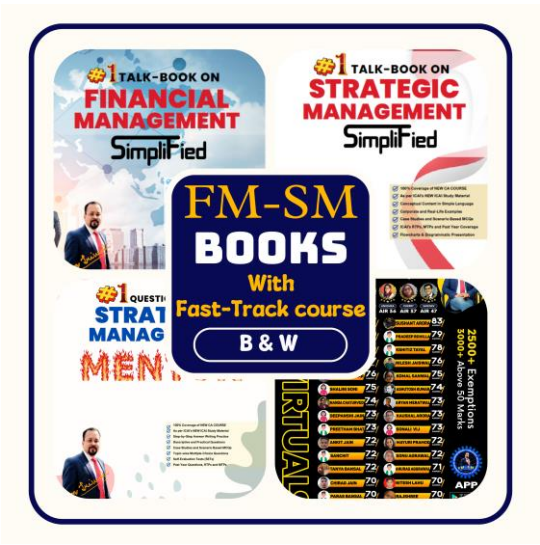
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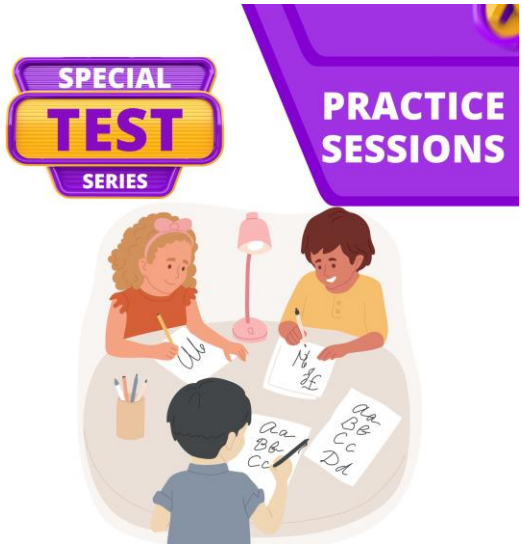
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