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J.K. SHAH TEST SERIES®
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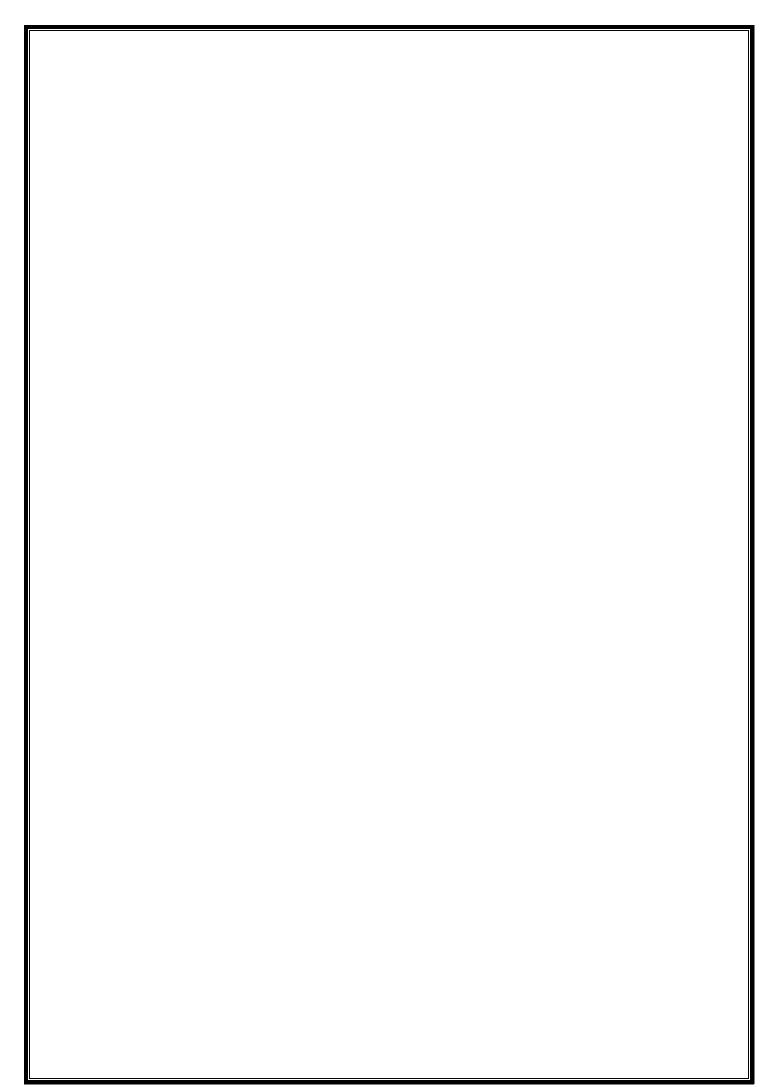### Evaluate Learn Succeed

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SUGGESTED SOLUTION

IPCC NOVEMBER 2016 EXAM

FINANCIAL MANAGEMENT

Test Code - I N J1 1 3 9

BRANCH - (MUMBAI) (Date : 21.08.2016)

Answer-1 :

Cost of Equity (K_e)

K_e = Risk free interest rate + (Beta X Average Market Risk Premium)

= 5.5%+ (1.1875 X 8%) = 15%

Yield to Maturity on Preference Shares and Cost of Preference Shares

$$98.5 = \frac{10.5}{(1+YTM)^1} + \frac{10.5}{(1+YTM)^2} + \frac{10.5}{(1+YTM)^3} + \frac{10.5}{(1+YTM)^4} + \frac{10.5}{(1+YTM)^5}$$

YTM = 11% (approx.)

∴ K_p = 11%

(1 Mark)

Yield to Maturity on Debentures and Cost of Debentures (K_d)

$$981.05 = \frac{95}{(1+YTM)^1} + \frac{95}{(1+YTM)^2} + \frac{95}{(1+YTM)^3}$$

YTM = 10% (approx.)

∴ K_d = YTM (1 - T) = 10% (1 – 0.35) = 6.5%

Cost of Term Loans (K_t)

K_t = I (1 - T) = 8.5% (1 - 0.35) = 5.525%

(1 Mark)

Calculation of WACC (on market value basis)

Source	Market value (Rs.)	Proportion	Cost of capital	Weighted average capital
Equity share capital	9,000.000	0.813	15%	12.195
10.5% Preference share capital	98.150	0.009	11%	0.099
9.5% Debentures	1471.575	0.133	6.5%	0.865
8.5% Term Loans	500.000	0.045	5.525%	0.249
	11069.725	1.000		WACC = 13.408

(3 Marks)

(ii)   Marginal Cost of Capital Schedule for the firm if it raises Rs. 750 million for a new project.

K_e of new project = 5.5% + (8% x 1.4375) = 17%

K_d of new project

on first 100 million = 9.5% + (1 – 0.35) = 6.175%

for next 50 million = 10% (1   0.35) = 6.5%

Marginal Cost of Capital

$$= \left[17\% \times \frac{600}{750}\right] + \left[6.175\% \times \frac{100}{750}\right] + \left[6.5\% \times \frac{50}{750}\right]$$

= 13.6% + 0.82% + 0.43%   = 14.85%

(3 Marks)

Answer-2 :

Calculation of NPV at different discounting rates

Particulars				Project C		Project D
0%	(10,000)	1.00	(10,000)	(10,000)	1.000	(10,000)
	2,000	1.00	2,000	10,000	1.000	10,000
	4,000	1.00	4,000	3,000	1.000	3,000
	12,000	1.00	12,000	3,000	1.000	3,000
			NPV = 8,000			NPV = 6,000
			Rank I			**Rank II**
10%	(10,000)	1.0000	(10,000)	(10,000)	1.0000	(10,000)
	2,000	0.9090	1,818	10,000	0.9090	9,090
	4,000	0.8264	3,306	3,000	0.8264	2,479
	12,000	0.7513	9,016	3,000	0.7513	2,254
			NPV = 4,140			NPV = 3,823

			Rank I			**Rank U**
15%	(10,000)	1.0000	(10,000)	(10,000)	1.0000	(10,000)
	2,000	0.8696	1,739	10,000	0.8696	8,696
	4,000	0.7561	3,024	3,000	0.7561	2,268
	12,000	0.6575	7,890	3,000	0.6575	1,973
			NPV = 2,653			NPV = 2,937
			Rank II			**Rank I**
30%	(10,000)	1.0000	(10,000)	(10,000)	1.0000	(10,000)
	2,000	0.7692	1,538	10,000	0.7692	7,692
	4,000	0.5917	2,367	3,000	0.5917	1,775
	12,000	0.4552	5,462	3,000	0.4552	1,366
			NPV = (633)			NPV = 833
			Rank II			**Rank I**
40%	(10,000)	1.0000	(10,000)	(10,000)	1.0000	(10,000)
	2,000	0.7143	1,429	10,000	0.7143	7,143
	4,000	0.5102	2,041	3,000	0.5102	1,531
	12,000	0.3644	4,373	3,000	0.3644	1,093
			NPV = (2,157)			NPV = (233)
			Rank II			**Rank I**

(8 Marks)

(i) Reason for Conflict in Ranking

The conflict in ranking arises because of skewness in cashflows. The cash flows of project occur more in later of its life. But in case of project D, the cashflows occur at the beginning of its life.

- At lower discount rate, project C's NPV will be higher than that of project D.
- As the discount rate increases, project C's NPV will fall at a faster rate, due to compounding effect.
- After break even discount rate, project D has higher NPV as well as higher IRR.

(1 Mark)

(ii) If the opportunity cost of funds is 10%, project C should be accepted because the firm's wealth will increase by Rs. 316 (i.e., Rs.4,139 - Rs. 3,823)

(1 Mark)

Incremental Analysis (Rs.)

Project	Cash flows (Rs.)				NPV at 10%	IRR 12.5%
	C_0	C_1	C_2	C_3		
C – D	0	-8,000	1,000	9,000	(-8,000 x 0.909) + (1,000 x 0.8264) + (9,000 x 0.7513)	(-8,000 x 0.88884) + (1,000 x 0.7898) + (9,000 x 0.7019)

Hence, Project C should be accepted, when opportunity cost of funds is 10%.

(2 Marks)

Answer-3 :

(i) Computation of EPS under three-financial plans.

Plan I: Equity Financing

	(Rs.)	(Rs.)	(Rs.)	(Rs.)	(Rs.)
EBIT	62,500	1,25,000	2,50,000	3,75,000	6,25,000
Interest	0	0	0	0	0
EBT	62,500	1,25,000	2,50,000	3,75,000	6,25,000
Less: Tax @ 40%	25,000	50,000	1,00,000	1,50,000	2,50,000
PAT	37,500	75,000	1,50,000	2,25,000	3,75,000
No. of equity shares	3,12,500	3,12,500	3,12,500	3,12,500	3,12,500
EPS	0.12	0.24	0.48	0.72	1.20

Plan II: Debt – Equity Mix

	(Rs.)	(Rs.)	(Rs.)	(Rs.)	(Rs.)
EBIT	62,500	1,25,000	2,50,000	3,75,000	6,25,000
Less: Interest	1,25,000	1,25,000	1,25,000	1,25,000	1,25,000
EBT	(62,500)	0	1,25,000	2,50,000	5,00,000
Less: Tax @ 40%	25,000*	0	50,000	1,00,000	2,00,000
PAT	(37,500)	0	75,000	1,50,000	3,00,000
No. of equity shares	1,56,250	1,56,250	1,56,250	1,56,250	1,56,250
EPS	(Rs. 0.24)	0	0.48	0.96	1.92

* The Company can set off losses against the overall business profit or may carry forward it to nextfinancial years.

Plan III: Preference Shares – Equity Mix

	(Rs.)	(Rs.)	(Rs.)	(Rs.)	(Rs.)
EBIT	62,500	1,25,000	2,50,000	3,75,000	6,25,000
Less: Interest	0	0	0	0	0
EBT	62,500	1,25,000	2,50,000	3,75,000	6,25,000
Less: Tax @ 40%	25,000	50,000	1,00,000	1,50,000	2,50,000
PAT	37,500	75,000	1,50,000	2,25,000	3,75,000
Less: Pref. dividend	1,25,000*	1,25,000*	1,25,000	1,25,000	1,25,000
PAT after Pref. dividend.	(87,500)	(50,000)	25,000	1,00,000	2,50,000
No. of Equity shares	1,56,250	1,56,250	1,56,250	1,56,250	1,56,250
EPS	(0.56)	(0.32)	0.16	0.64	1.60

* In case of cumulative preference shares, the company has to pay cumulative dividend topreference shareholders, when company earns sufficient profits.

(ii) From the above EPS computations tables under the three financial plans we can see thatwhen EBIT is Rs. 2,50,000 or more, Plan II: Debt-Equity mix is preferable over the Plan I andPlan III, as rate of EPS is more under this plan. On the other hand an EBIT of less thanRs.2,50,000, Plan I: Equity Financing has higher EPS than Plan II and Plan III. Plan IIIPreference share-Equity mix is not acceptable at any level of EBIT, as EPS under this planis lower.

The choice of the financing plan will depend on the performance of the company and othermacro economic conditions. If the company is expected to have higher operating profitPlan II: Debt – Equity Mix is preferable. Moreover, debt financing gives more benefit dueto availability of tax shield.

(iii)   EBIT – EPS Indifference point : Plan I and Plan II

$$\frac{EBIT_1 \times (1\text{-}t)}{\text{No. of equity Shares } (N_1)} = \frac{\left(EBIT_2 \text{-Interest}\right) \times (1\text{-}t)}{\text{No. of equity shares } (N_2)}$$

$$\frac{EBIT (1\text{-}0.40)}{3,12,500 \text{ sgares}} = \frac{(EBIT\text{-Rs.}1,25,000) \times (1\text{-}0.40)}{1,56,250 \text{ sgares}}$$

0.6 EBIT   = 1.2 EBIT – Rs.1,50,000

EBIT $= \dfrac{\text{Rs.}1,50,000}{0.6}$ = Rs.2,50,000

Indifference points between Plan I and Plan II is Rs. 2,50,000

EBIT – EPS Indifference Point: Plan I and Plan III

$$\frac{EBIT_1 \times (1-t)}{\text{No. of equity shares } (N_1)} = \frac{EBIT_3 \times (1\text{-}t)\text{-Pref.dividend}}{\text{No. of equity shares } (N_3)}$$

$$\frac{\text{EBIT}_1 \ (1-0.40)}{3,12,500 \text{ shares}} = \frac{\text{EBIT}_3 \ (1-0.40) - \text{Rs.}1,25,000}{1,563250 \text{ shares}}$$

$$0.6 \ \text{EBIT} = 1.2 \ \text{EBIT} - \text{Rs. } 2,50,000$$

$$\text{EBIT} = \frac{\text{Rs.}2,50,000}{0.6} = \text{Rs.}4,16,667$$

Indifference points between Plan I and Plan III is Rs. 4,16,667.

(2 Marks)

Answer-4 :
Pattern of additional finance (Rs.)

Equity	15,00,000
Debt	5,00,000
Total additional finance	20,00,000

(Rs.)

Retained earnings	4,00,000
Additional equity to be raised	11,00,000
Total equity	15,00,000

(Rs.)

1096 Debt	2,00,000
1396 Debt	3,00,000
Total debt	5,00,000

(2 Marks)

(i)   Calculation of Post tax average cost of additional debt

Interest = (Rs. 2,00,000 X 10/100) + (Rs. 3,00,000 X 13/100)

       = Rs. 20,000 + Rs. 39,000   = Rs.59,000

$$K_d = \frac{\text{Rs.}59,000 \ (1-03)}{\text{Rs.}5,00,000} \times 100 = \frac{\text{Rs.}41,300}{\text{Rs.}5,00,000} \times 100 \qquad = \text{Rs.}8.26$$

(1 Mark)

(ii)   Calculation of cost of retained earnings and cost of equity

$$K_e = \frac{\text{EPS x Payout}}{\text{Market Price}} + G = \frac{\text{Rs.}12 \times 50/100}{\text{Rs.}60} + 10\% \qquad = 20\%$$

$$K_r = K_e \ (1 - tp) = 20 \ (1 - 0.2) \qquad = 16\%$$

(2 Marks)

(iii)   Calculation of overall weighted average (after tax) cost of additional finance

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Particulars	Amount(Rs.)	After tax	Cost(Rs.)
Equity capital	11,00,000	20%	2,20,000
Retained earnings	4,00,000	16%	64,000
Debt	5,00,000	8.26%	41,300
	20,00,000		**3,25,300**

$$\text{Overall Cost of Capital (K}_o\text{)} = \frac{\text{Rs.}3,25,300}{\text{Rs.}20,00,000} \times 100 = 16.27\%$$

(3 Marks)

Answer-5 (a) :
Computation of Rate of Interest and Revised Maturity Value

Principal = Rs. 10,000

Amount = Rs. 12,625

$$10,000 = \frac{12,625}{\left(1+i\right)^4}$$

$P_n = A \times (PVF_{n,i})$

$0.7921 - (PVF_{4,i})$

(2.5 Marks)

According to the Table on Present Value Factor ($PVF_{4,i}$) of a lump sum of Re. 1, a PVF of 0.7921 for half year at interest (i) = 6 percent. Therefore, the annual interest rate is 2 × 0.06 = 12 percent.

$\quad$ i = 6% for half year

$\quad$ i = 12% for full year.

Therefore, Rate of Interest = 12% per annum

Revised Maturity Value $= 10{,}000 \left[1 + \dfrac{12}{100} \times \dfrac{1}{4}\right]^{2 \times 4} = 10{,}000 \left(1 + \dfrac{3}{100}\right)^{8} = 10{,}000 \left(1.03\right)^{8}$

$\qquad\qquad\qquad\qquad$ = 10,000 x 1.267 [Considering ($CVF_{8,3}$) = 1.267]

Revised Maturity Value = 12,670.

(2.5 Marks)

Answer-5 (b) :

Computation of Compound Value and Compound Interest

Semiannual Rate of Interest (i) = 8/2 = 4 %

$\qquad$ n = 5 x 2 = 10, $\qquad$ P = Rs. 75,000

Compound Value $\qquad = P\,(1+i)^{n}$

$\qquad\qquad\qquad\qquad = 75{,}000\,(1+4\,\%)^{10}$

$\qquad\qquad\qquad\qquad$ = 75,000 x 1.4802

$\qquad\qquad\qquad\qquad$ = Rs. 1,11,015

Compound Interest $\qquad$ = Rs. 1,11,015 – Rs. 75,000 = Rs.36,015

(5 Marks)