



# Suggested Solution

## Test-7

Mission 80+ for N/D24



Case Scenario-I		
(i)	(d)	both (ii) & (iii) are correct
(ii)	(c)	1.90913 mill
(iii)	(d)	15%
(iv)	(b)	7%

**Hint:**

**(i)**

Fund required = \$ 20 million (net)

Issue exp = 3%

Issue price in (₹) = 300 - 10% of 300 = ₹270

Issue value of 1 GDR(₹) = 270 × 3 = 810

Net proceeds per GDR (₹) = ₹810 - 3% of 810 = ₹785.70

Issue price of 1 GDR(\$ ) = (810/75) = \$10.80

Net proceeds per GDR = \$10.80 - 3% of 10.80 = \$10.476

**(ii) No. of GDR to be issued:**

$$= \frac{\$20 \text{ mill}}{\$ 10.476} = 1.90913 \text{ mill}$$

**(iii) Cost of GDR:**

Dividend per share = Face value × 10% = 100 × 10% = ₹10

Dividend per GDR (₹) = ₹10 × 3 = ₹30

Dividend per GDR (\$) =  $\frac{30}{75} = \$0.4$

$$\text{Cost of GDR} = \left[ \frac{D_1}{NP} + g \right] = \left[ \frac{\$0.4}{10.476} + g \right]$$

$$\text{Or, } 0.18818\% = 0.03818 + g$$

$$\text{Or, } g = 0.15 = 15\%$$

**Second Alternative:**

Dividend per share = ₹ 10 (D<sub>1</sub>)

Issue price = ₹ 270



Suggested Solution-Test-7

$$\text{Net proceeds} = ₹ 270 - 3\% = 261.9$$

$$\text{Cost of GDR} = \left[ \frac{D_1}{NP} + g \right] = \left[ \frac{₹ 10}{261.9} + g \right]$$

$$\text{Or, } 0.18818\% = 0.03818 + g$$

$$\text{Or, } g = 0.15 = 15\%$$

$$(iv) \text{ Effective cost of Loan} = \frac{10.5}{(100 - 2.94)\%} = \frac{10.5}{97.06\%} = 10.818\%$$

To be at indifference, Cost of GDP should also be 10.818%.

$$\text{Now, } 0.10818\% = D_1 / NP_0 + g$$

$$\text{Or, } 0.10818\% = 0.03818 + g$$

$$\text{Or, } g = 0.07 = 7\%$$

**Case Scenario-II**

(i)	(b)	11.70 million
(ii)	(b)	6.15 million
(iii)	(c)	9%
(iv)	(b)	NPV decreases [Error in question, as only (b) option is true] Rectified Question ".....in this case which of the statement is <del>not</del> true:"

**Hint:**

	Old Bond	New Bond
Value of Bond	300 million	300 million
Coupon	12%	?
Remaining life	6 years	6 years
Issue cost	-	6 million
Call premium	4%	-
Call value	300+4% = 312 million	-
Unamortized cost	9 million	-
Annual amortizable cost	9/6 = 1.5	6/6 = 1



(i) **Net initial outflow:**

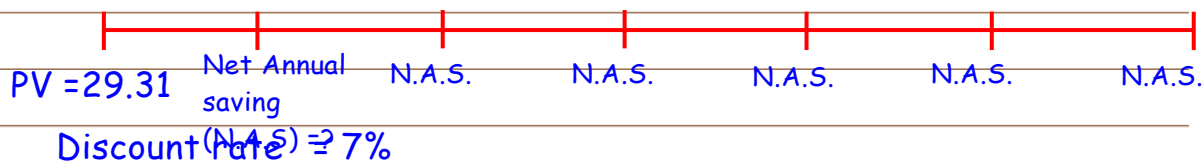
	₹ in million
(i) Repayment of old bond with premium	312
(ii) Net proceeds from new Bond (300-6)	(294)
(iii) Tax saving on premium on old bond (12 × 30%)	(3.6)
(iv) Tax saving on unamortized cost on old bond (9 × 30%)	(2.7)
<b>Net initial outflow</b>	<b>11.70</b>

(ii) **Annual Saving:**

NPV = PV of Annual Savings - Net initial outflow

Or, PV of Annual Savings = NPV + Net initial outflow

$$= 17.61 + 11.70 = 29.31$$



$$\begin{aligned} \text{Net of tax Annual Savings} &= \frac{PV}{PVIFA(7\%,6)} \\ &= 29.31 / 4.7665 = 6.15 \text{ million} \end{aligned}$$

(iii)

	₹ in million
(i) Annual interest saving	Let $x$
(ii) Decrease in tax saving on interest ( $x \times 30\%$ )	$0.30x$
(iii) Decrease in tax saving on decrease in amortizable cost $[(1.5 - 1) \times 30\%]$	(0.15)
<b>Net of tax Annual Savings</b>	<b><math>0.7x - 0.15</math></b>

Net of tax Annual Savings = 6.15

$$\text{Or, } 0.7x - 0.15 = 6.15$$

$$\text{Or, } x = 6.30 / 0.7 = 9$$

Annual interest saving = 9 million

Annual Interest under new bond = 36 million



Annual interest under New Bond =  $36 - 9 = 27$  million

New Coupon Rate =  $27/300 = 9\%$

- (iv) If overlapping period is two months, interest on both bonds will be paid during first two months. In this case, annual saving during 1<sup>st</sup> & 2<sup>nd</sup> Year will decrease and as a result, NPV will decrease.

**MCQ-III**

(b) Circus Swap

Hint: A more complex version of a currency swap is a **currency coupon swap**, which swaps a fixed -or-floating rate interest payment in one currency for a floating rate payment in another. These are also known as Circus Swaps.

**MCQ-IV**

(d) Increase in profit by ₹10 per unit

Hint: Present spot rate = ₹90/£

i.e., 1₹ = 1/90 £

if ₹ depreciates by 10%,

1₹ =  $1/90 \times 90\% = 1/100$ £

Or, 1£ = ₹100.

Increase in profit by  $100 - 90 = ₹10$  per unit.



**Part II (Descriptive Questions)**

**Question-1 Solution:**

EBIT = 32 Lakh

Retain of similar company = 9.6%, if two condition satisfy

Future Inflow = 50% of div + 5% of REPS

**Income Statement**

Particulars	₹ in Lakh
EBIT	32
Less: - Interest (64 x 12%)	7.68
<b>EBT</b>	<b>24.32</b>
Less: - Tax @35%	8.512
<b>EAT</b>	<b>15.808</b>
Less: - Pref. dividend (40 x 8%)	3.20
<b>EAE</b>	<b>12.608</b>
Less: - Equity Div. (80 x 8%)	6.40
<b>Retained Earning</b>	<b>6.208</b>

$$\text{EPS} = \frac{12.608 \text{ Lakh}}{0.80 \text{ Lakh}} = ₹ 15.76$$

$$\therefore \text{No. of share} = \frac{80 \text{ Lakh}}{₹ 100} = 0.80 \text{ Lakh}$$

$$\text{DPS} = \frac{6.40}{0.8} = 8$$

$$\text{REPS} = \frac{6.208}{0.8} = 7.76$$

(i) **Annual inflows (per share):**

= 50% of DPS + 5% of REPS

= (8 × 50%) + (7.76 × 5%) = 4.388

(ii) **Required return of equity holder:**



The required return should be 9.6% (proxy return) if 2 conditions satisfy. Otherwise make adjustment of risk in 9.6% to calculate RR.

**Note (Not for exam):**

- EAT can't cover interest and dividend.
- EBIT covers three expenses  $\Rightarrow$  Interest, tax, and pref. dividend.
- (EBIT - Tax)  $\Rightarrow$  Covers Interest and preference dividend.

Or (EAT + Interest)

- Hence, Interest & Dividend coverage ratio.

$$= \left[ \frac{\text{EAT} + \text{Interest}}{\text{Pref. Dividend} + \text{Interest}} \right]$$

- Capital gearing ratio.

$$= \left[ \frac{\text{Fixed cost bearing capital}}{\text{Non fixed cost bearing capital}} \right] = \left[ \frac{\text{Debt} + \text{Pref.}}{\text{Equity}} \right]$$

**Condition - 1:**

$$\text{Coverage Ratio} = \left[ \frac{\text{EAT} + \text{Interest}}{\text{Dividend} + \text{Interest}} \right] = \frac{15.808 + 7.68}{3.20 + 7.68} = 2.16 \text{ times}$$

- Industry coverage ratio is 3 times, but Sun Limited coverage ratio is only 2.16 times.
- It shows Sun Limited is more risky than industry / proxy entity. Hence RR should be higher than 9.6%
- Difference in coverage ratio = 3 - 2.16 = 0.84 times.

Hence, Increase RR by .84%

- **Given:** For 1 times difference  $\Rightarrow$  Adjustment 2%

$$\text{For 0.84 times difference} \Rightarrow \text{Adjustment } \frac{2\%}{1} \times 0.84 = 1.68\%$$

Hence, RR should be 1.68% Higher.

**Condition - 2:**

$$\text{Gearing ratio of Sun Limited} = \left[ \frac{\text{Debt} + \text{Pref.}}{\text{Equity}} \right] = \frac{64 + 40}{80 + 32} = 0.93$$



- Gearing ratio of similar company is 0.75 times but for Sun Limited it is 0.93 times. It indicates Sun Limited is more risky than Similar company.

- Hence, RR should be higher than 9.6%.

- Adjustment: Difference = 0.93 - 0.75 = 0.18 times

- **Given:** For 1 times difference  $\Rightarrow$  Adjustment 1%

For 0.18 times difference  $\Rightarrow$  Adjustment = 0.18%

Hence, RR should be 0.18% Higher.

$\Rightarrow$  **Required return after adjustment.**

$$= 9.6\% + 1.68\% + 0.18\% = 11.46\%$$

(iii) Price of share:

$$= \left[ \frac{\text{Inflow}}{\text{RR}} \right] = \frac{4.388}{0.1146} = ₹ 38.3$$

### Question -2 Solution:

Share price = ₹ 480 (FV = 100)

Bonus ratio =  $\frac{1}{5} = 0.20$  (5<sup>th</sup> year)

Expected div (before bonus) = 100  $\times$  30% = ₹30

P<sub>8</sub> = ₹1,000

Transaction cost = 5% of market price

RR = 15%

If shareholder buys 1 share today then he will receive 0.20 bonus in 5<sup>th</sup> year.

It means:

No. of shares (1-4 years) = 1

No. of shares (5-8 years) = 1.20

D<sub>1</sub> = ₹30; D<sub>2</sub> = ₹30; D<sub>3</sub> = ₹30; D<sub>4</sub> = ₹30

D<sub>5</sub> = ₹30  $\times$  1.20 share = ₹36

D<sub>6</sub>, D<sub>7</sub> & D<sub>8</sub> = ₹36



PV = ?

30 30 30 30 36 36 36 36

+ (1000 × 1.20) - 5%

$$\begin{aligned}
 P_0 &= 30 \times PVIFA(15\%, 4) + (36 \times \text{sum of PVF @15\% from 5 to 8}) \\
 &+ 1140 \times PVIF(15\%, 8) \\
 &= (30 \times 2.855) + (36 \times 1.632) + (1140 \times 0.327) \\
 &= 517.18 \text{ (Including 5\% transaction cost) [fair investment]}
 \end{aligned}$$

Effective cost of investment of Mr. A

$$= 480 + 5\% \text{ of } 480 = ₹504$$

**Recommendation:**

Since the present value price of share is Rs. 517.18 as compared to Rs 504, it is suggested to buy the securities.

**Max price to be paid (Fair price):**

The maximum price he can pay for the security is Rs. 517.18(including incidental expenses).

$$105\% \text{ value} = 517.18$$

$$\therefore \text{Price} = \frac{517.18}{105\%} = 492.55 \text{ (exclusive of incidental expense)}$$

**QUESTION - 3 Solution:**

$$\text{Assets turnover Ratio} = \frac{\text{Sales}}{\text{Assets}}$$

(i) **Income Statement:**

$$\text{Assets turnover Ratio} = \frac{\text{Sales}}{600}$$

$$\text{Or, } 2 = \frac{\text{Sales}}{1200}; \text{ sales} = 1200 \times 2 = ₹2,400$$



Particulars	₹ in Lakh
Sales	2400
Less: Operating cost (90%)	2160
<b>Operating Profit (EBIT) (10%)</b>	240
Less: Interest on debt (350 x 10%)	35
<b>EBT</b>	205
Less: - Tax (30%)	61.50
<b>EAT</b>	143.50
Less: Equity Dividend (20%)	28.70
<b>Retained Earning</b>	114.80

(ii) Sustainable Growth rate:

$$ROE = \left[ \frac{EAE}{\text{Equity}} \times 100 \right]$$

$$= \frac{143.50}{(600+200)} \times 100 = 17.94\%$$

$$\text{Retention Ratio (b)} = 100 - 20 = 80\%$$

$$\text{Growth (g)} = (b \times ROE)$$

$$= 0.80 \times 0.1794 = 0.1435 \text{ (i.e., 14.35\%)}$$

(iii) Fair price of share:

**Interpretation (Not for Exam):**

Question information indicates today is end of 2008 and we prepared income statement for 2008 at end of 2008. Hence, we can say dividend calculated in Income statement is  $D_0$

Alternatively, we assume  $D_1$  also.

$$D_0 = \left[ \frac{\text{Dividend}}{\text{No. of share}} \right] = \frac{28.70 \text{ Lakh}}{20 \text{ Lakh}} = 1.435$$

$$D_1 = D_0 \times (1 + g) = 1.435 \times (1 + 0.1435) = 1.642$$

$$\text{Price of share (P}_0) = \left[ \frac{D_1}{RR - g} \right] = \left[ \frac{1.642}{0.18 - 0.1435} \right] = ₹ 44.98$$



(iv) **Investment Decision:**

Fair price = ₹ 44.98

Actual price = ₹ 28

As share is undervalued, it is beneficial to buy share.

**QUESTION - 4 Solution:**

Evaluation of given two options: -

**Option - 1:-**

**While covering payable in forward market**

Spot rate \$1	₹ 78.50 / 78.70
Add: 3 Month swap points	<u>0.40 / 0.90</u>
	78.90 / 79.60

Exchange margin @ 0.125%	<u>-0.125% / +0.125%</u>
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78.80 / 79.6995

3M Forward Rate (Rounded off)	78.80 / 79.70
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Payable at 3 Months (7,00,000 × 79.70)	₹ 5,57,90,000
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Receivable at 2 months (4,50,000 × 78.90)	(₹3,55,05,000)
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Interest for 1 month (Assuming that received amount invested)	(3,55,050) (₹3,55,05,000 × 12% × 1/12)
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Net payable at 3 months	₹ 1,99,29,950
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**Option - 2:-**

Since the forward contract for receivable was already booked it shall be cancelled if we lag the receivables. Accordingly, any profit/ loss on cancellation of contract shall also be calculated and shall be adjusted as follows:

**Loss from cancellation of contract**

**Cancellation Rate:**

Spot rate \$1	₹78.50 / 78.70
Add: 2 Month swap points	<u>0.20 / 0.50</u>



	78.70 / 79.20
Exchange margin @ 0.125%	<u>-0.125% / + 0.125%</u>
	78.60 / 79.30 (Rounded off)
Cancellation Rate	79.30 (Buy)
Cancellation charges	₹ 1,80,000
	$4,50,000 \times (79.30 - 78.90)$
Interest on charges for 3 Months	₹ 5,400 (optional)
	$[1,80,000 \times 12\% \times 3/12]$
3m Forward rate for Net payable of \$ 2,50,000	= 79.70 (calculated in option - 1)
Payable for \$ 2,50,000	= ₹ 1,99,25,000
	$(79.70 \times 2,50,000)$
Total payable	= ₹ 1,99,25,000 + ₹ 1,80,000 = ₹ 2,01,05,000
OR, ₹ 2,01,05,000 + ₹ 5,400	= ₹ 2,01,10,400 (if interest on cancellation charge also considered)
Since, net payable in Option - I is lower than that of option - II, it is advisable to opt option - 1.	

**QUESTION - 5 Solution:**

(i) Portfolio position: -

	Value	Weight
Long position in Sec - A	3,00,000	3/2
Short position in sec - B	(1,00,000)	$-\frac{1}{2}$
	2,00,000	1

**Factor - 1 Sensitivity: -**

$$\begin{aligned} \beta(\text{port}) &= \sum(\text{weight} \times \text{Beta}) \\ &= 3/2 \times 0.8 - \frac{1}{2} \times 1.5 \\ &= 0.45 \end{aligned}$$

**Factor - 2 Sensitivity: -**

$$= 3/2 \times 0.6 - \frac{1}{2} \times 1.2 = 0.30$$



(ii) Portfolio combination: -

	Value	Weight
Risk free Borrowing	-1,00,000	-1/2
Long position in sec - A	4,50,000	4.5/2
Short position in sec - B	1,50,000	-1.5/2
	<b>2,00,000</b>	<b>1</b>

Sensitivity of portfolio  $\beta(\text{port})$

$$\text{Due to Factor - 1} = -1/2 \times 0 + \frac{4.5}{2} \times 0.08 - \frac{1.5}{2} \times 1.5 = 0.675$$

$$\text{Due to factor - 2} = -1/2 \times 0 \times \frac{4.5}{2} \times 0.6 - \frac{1.5}{2} \times 1.2 = 0.45$$

(iii) Expected return of portfolio mentioned in (ii) using APT,

$$\begin{aligned} \text{ER} &= (10 \times -\frac{1}{2}) + (15 \times \frac{4.5}{2}) + (20 \times -\frac{1.5}{2}) \\ &= -5 + 33.75 - 15 = 13.75\% \end{aligned}$$

$$\text{Expected Return Premium} = 13.75\% - 10\% = 3.75\%$$

**QUESTION - 6 Solution:**

Given information :

ACC stock

$$\text{Spot price of stock} = 220$$

$$\text{Actual future price} = 218$$

(i) Fair Future Price

$$= SP \times (1 + PIR)^n - \text{FV of dividend}$$

$$= 220 \times (1 + 0.15 \times 3/12)^1 - 10 \times 25\%$$

$$= \boxed{225.75}$$



(ii)

Fair Future Price = 225.75

Actual Future Price = 218

Actual Future Price is lesser than fair future price, it is undervalued.

Following action for arbitrage :

- Buy stock future @ 218
- Sell stock in cash segment

Step 1: Sale proceeds from stock = 220

Step 2: Invest sale proceeds for 3 months  
Withdrawal amount =  $220 \times (1 + 0.15 \times 3/12)$   
= 228.25

Step 3: Outflow to Buy stock in cash segment  
after 3m = 218

$\therefore$  Arbitrage Gain = Step 2 - Step 3 - dividend foregone

$$= 228.25 - 218 - 2.5$$

$$= \boxed{7.75}$$