

CA FINAL (NEW SCHEME)
STRATEGIC FINANCIAL MANAGEMENT
JANUARY 2021 – SUGGESTED ANSWERS

Question 1(a) [5 Marks]:

A US Investor chose to invest in Sensex for a period of one year. The relevant information is given below:

Size of Investment (\$)	20,00,000
Spot rate 1 year ago (Rs/\$)	42.50/60
Spot rate now (Rs/\$)	43.85/90
Sensex 1 year ago	3,256
Sensex now	3,765
Inflation in US	5%
Inflation in India	9%

- Compute the nominal rate of return to the US Investor.
- Compute the real depreciation / appreciation of Rupee.
- What would be the exchange rate if relevant purchasing power parity holds good?
- What will be the real return to an Indian Investor in Sensex?

Solution

- (i) Nominal Rate of Return to US Investor

Investment in US \$: 20,00,000

Investment in INR: 20,00,000\$ X Rs. 42.50 = Rs. 850,00,000

(For converting \$ into INR i.e., for selling \$, bid-rate must be considered)

Sensex at the time of investment: 3256

No. of Units of Sensex bought: Rs. 850,00,000 / 3256 = 26105.65

Sensex at present: 3765

Amount realised on sale of Sensex units = 26105.65 X 3765 = Rs. 982,87,772.25

Conversion of sale proceeds into US \$

= Rs. 982,87,772.25 / Rs. 43.90 = **22,38,901.42\$**

(Ask Rate must be considered for buying of \$)

Nominal Return for the US Investor = $\frac{\$22,38,901.42 - \$20,00,000}{\$20,00,000} \times 100 = \mathbf{11.95\%}$

- (ii) Real Depreciation / Appreciation in Rupee:

(Rs/\$) 1 year ago – Average = (Rs. 42.50 + Rs. 42.60) / 2 = Rs. 42.55

So, (\$/Re)_{1 year ago} = 1/42.55 = **0.023502**

(Rs/\$) Now – Average = (Rs. 43.85 + Rs. 43.90) / 2 = Rs. 43.875

So, (\$/Re)_{Now} = 1/43.875 = **0.022793**

Appreciation / Depreciation = $\frac{F-S}{S} \times 100 \times \frac{12}{N}$

So, Appreciation / Depreciation in Rupee = $\frac{0.022793 - 0.023502}{0.023502} \times 100 \times \frac{12}{12} = \mathbf{-3.017\%}$

(iii) Exchange Rate on the basis of Purchasing Power Parity Theory:

According to PPP Theory,

$$\frac{F}{S} = \frac{(1 + ih)^t}{(1 + if)^t}$$

$$\text{So, } F = \frac{(1+ih)^t}{(1+if)^t} \times S$$

Therefore,

$$(\text{Rs}/\$)_{\text{Bid}} = \text{Rs. } 42.50 \times \frac{1.09}{1.05} = \text{Rs. } 44.12$$

$$(\text{Rs}/\$)_{\text{Ask}} = \text{Rs. } 42.60 \times \frac{1.09}{1.05} = \text{Rs. } 44.22$$

(iv) Real Rate of Return to an Indian Investor in Sensex:

$$\text{Nominal Return in Sensex for one year} = \frac{(3765-3256)}{3256} \times 100 = 15.63\%$$

$$[(1+r)(1+i)] = (1+n)$$

r = Real Rate of Interest

i = Rate of Inflation

n = Nominal Rate of

$$\text{So, } r = \frac{(1+n)}{(1+i)} - 1 = \frac{1.1563}{1.09} - 1 = 0.0608 = 6.08\%$$

Question 1(b) [5 Marks]:

Bank A enters into a Repo for 21 days with Bank B in 8% Government of India Bonds 2020 @ 6.10% for Rs. 5 Crores. Assuming that clean price is Rs. 97.30 and initial margin is 1.50% and days of accrued interest are 240 days (assume 360 days in a year).

Compute:

(i) The dirty price.

(ii) The repayment at maturity.

Solution

(i) Dirty Price:

Dirty Price = Clean Price + Accrued Interest

$$\text{So, Dirty Price} = \text{Rs. } 97.30 + (\text{Rs. } 100 \times 8\% \times 240/360) = \text{Rs. } 102.63$$

(ii) Repayment at Maturity:

$$\text{Repayment at Maturity} = \text{Start Proceeds} \times [1 + \text{Repo Rate} \times \text{No. of Days} / 360]$$

$$\text{Start Proceeds} = \text{Nominal Value} \times \frac{\text{Dirty Price}}{100} \times \frac{100 - \text{Initial Margin}}{100}$$

$$\text{So, Start Proceeds} = \text{Rs. } 5,00,00,000 \times \frac{102.63}{100} \times \frac{100 - 1.50}{100} = \text{Rs. } 5,05,45,275$$

Therefore, Repayment at Maturity = Rs. 5,05,45,275 X $\left[1 + \left(0.610 \times \frac{21}{360}\right)\right]$
= **Rs. 5,07,25,132**

Question 1(c) [5 Marks]:

Following is the information for the free options bond:

Face Value of the Bond	Rs.1000
Coupon Rate	7%
Terms of Maturity	7 years
Yield to Maturity	8%

You are required to calculate:

- (i) Market price of the bond and duration.
(ii) If there is a increase in the yield by 35 basis points what would be the price of the bond?

Present Value	t1	t2	t3	t4	t5	t6	t7
PVIF _{0.07, t}	0.935	0.874	0.817	0.764	0.714	0.667	0.623
PVIF _{0.08, t}	0.926	0.857	0.794	0.735	0.681	0.631	0.584

Solution

- (i) Market Price and Duration

Price of Coupon Bond =

[C x PV of Annuity of Re. 1 @ i% for n years] + [M x PV of Re. 1 @ i% at the end of nth year]

So, Price of the Bond = (Rs. 70 X 5.208) + (Rs. 1000 X 0.584) = **Rs. 948.56**

Duration for a Coupon Bond = $\left[\frac{1+y}{y}\right] - \left[\frac{(1+y)+n(c-y)}{c\{(1+y)^n-1\}+y}\right]$

So, Duration = $\left[\frac{1+0.08}{0.08}\right] - \left[\frac{(1+0.08)+7(0.07-0.08)}{0.07\{(1+0.08)^7-1\}+0.08}\right]$

That is,

Duration = 13.5 - $\left[\frac{1.01}{0.12996}\right] = 13.5 - 7.77 = \mathbf{5.73 \text{ Years}}$

- (ii) Price of the Bond if yield increases by 35 basis points

Change in Bond Value = -MD X Change in Interest Rate

Modified Duration (MD) = $\frac{\text{Duration}}{(1+y)} = \frac{5.73}{(1+0.08)} = \mathbf{5.31}$

That is,

Change in Bond Value = **-5.31 X Change in Interest Rate**

When the yield (i.e., expected return) increases by 35 basis points (i.e., 0.35%), the price of the Bond will be-

Change in Bond Value = -5.31 X 0.35% = **-1.86%**

So, Value of Bond = Rs. 948.56 - (1.86% X Rs. 948.56) = **Rs. 930.92**

Question 1(d) [5 Marks]:

M/s B Ltd., has declared dividend of Rs. 2.50 per share on the EPS of Rs. 7. Earnings of the company are expected to grow at the rate of 10% for the next 3 years and to be stabilised at 3% thereafter.

The pay-out ratio is expected to remain at the same level during 3 years and then will increase to 60%. If required rate of return is 16%, calculate:

- (i) The current price of the share.
(ii) The expected price of share of B Ltd., at the end of 3rd year.

Following table may be used for calculations

Present Value	t1	t2	t3	t4	t5
PVIF _{0.16, t}	0.862	0.743	0.641	0.553	0.477

Solution

- (i) Current Price of the Share

Year	EPS	DPS	PV of Re. 1 @ 16%	PV of Dividends
0	7.000	2.500		
1	7.700	2.750	0.862	2.371
2	8.470	3.025	0.743	2.248
3	9.317	3.328	0.641	<u>2.133</u>
				6.751
4	9.597	5.758		
Add: Continuing Value ((Rs. 5.758)/(0.16-0.03))X0.641				28.391
Value of the Share				35.142

- (ii) Expected Price of the Share at the end of 3rd Year:

Expected Dividends at the end of Year 4: Rs. 5.758 (60% of Rs. 9.597)

Growth Rate: 3% forever

So, Value of the Share at the beginning of year 4 or end of year 3 =

$$\frac{\text{Rs. 5.758}}{0.16-0.03} = \text{Rs. 44.29}$$

Question 2(a) [8 Marks]:

Following are the details of a portfolio consisting of three shares:

Share	Portfolio Weight	Beta	Expected Return in %	Total Variance
DGS	0.35	0.30	12%	0.010
DV	0.25	1.20	18%	0.030
BP	0.40	0.50	10%	0.015

Standard Deviation of Market Portfolio Returns = 14%.

Covariance (DGS, DV) = 0.020

Covariance (DV, BP) = 0.050

Covariance (BP, DGS) = 0.030

You are required to calculate:

- (i) The Portfolio Beta.
- (ii) Residual variance of each of the three shares.
- (iii) Portfolio variance using Sharpe Index Model.
- (iv) Portfolio Variance (on the basis of modern portfolio theory given by Markowitz)

Solution

Question (i):

$$\sum w_i \beta_i = (0.35 \times 0.30) + (0.25 \times 1.20) + (0.40 \times 0.50) = \mathbf{0.605}$$

Question (ii):

Stock	Total Variance (% ²) [σ_i^2]	Systematic Variance [$\beta_i^2 \sigma_m^2$]	Unsystematic Variance [$\sigma_i^2 - \beta_i^2 \sigma_m^2$]
DGS	100	$(0.3^2 \times 14^2) = 17.64$	82.36
DV	300	$(1.2^2 \times 14^2) = 282.24$	17.76
BP	150	$(0.5^2 \times 14^2) = 49$	101

Question (iii):

$$\text{Portfolio Variance: } \sigma_p^2 = [(\sum w_i \beta_i)^2 \sigma_m^2] + [\sum w_i^2 \sigma_{ei}^2]$$

Calculation of Systematic Variance of the Portfolio:

$$[(\sum w_i \beta_i)^2 \sigma_m^2 = (0.605)^2 \times 14^2 = \mathbf{71.7409}]$$

Calculation of Unsystematic Variance of the Portfolio:

$$\sum w_i^2 \sigma_{ei}^2 = (0.35^2 \times 82.36) + (0.25^2 \times 17.76) + (0.40^2 \times 101) = \mathbf{27.3591}$$

Calculation of Portfolio Risk:

$$\text{So, Portfolio Variance} = 71.7409 + 27.3591 = \mathbf{99.1\%}^2$$

Question (iv):

$$\sigma_p^2 = \sum W_A^2 \sigma_A^2 + W_B^2 \sigma_B^2 + W_C^2 \sigma_C^2 + 2W_A W_B \text{COV}_{AB} + 2W_A W_C \text{COV}_{AC} + 2W_B W_C \text{COV}_{BC}$$

So,

$$\sigma_p^2 = (0.35^2 \times 100) + (0.25^2 \times 300) + (0.4^2 \times 150) + (2 \times 0.35 \times 0.25 \times 200) + (2 \times 0.35 \times 0.4 \times 300) + (2 \times 0.25 \times 0.4 \times 500)$$

$$\sigma_p^2 = 12.25 + 18.75 + 24 + 35 + 84 + 100 = \mathbf{274\%}^2$$

Question 2(b) [8 Marks]:

Mr. A is holding 1000 shares of face value of Rs. 100 each of M/s. ABC Ltd. He wants to hold these shares for long term and have no intention to sell.

On 1st January 2020, M/s. XYZ Ltd., has made short sales of M/s. ABC Ltd.'s shares and approached Mr. A to lend his shares under Stock Lending Scheme with following terms:

- (i) Shares to be borrowed for 3 months from 01-01-2020 to 31-03-2020.
- (ii) Lending charges / fees of 1% to be paid every month on the closing price of the stock quoted in Stock Exchange, and
- (iii) Bank Guarantee will be provided as collateral for the value as on 01-01-2020.

Other information:

- (a) Cost of Bank Guarantee is 8% per annum,
- (b) On 29-02-2020 M/s. ABC Ltd., declared dividend of 25%.
- (c) Closing price of M/s. ABC Ltd.'s share quoted in Stock Exchange on various dates are as follows:

Date	Share Price in Scenario 1 – Bullish	Share Price in Scenario 2 – Bearish
01-01-2020	1000	1000
31-01-2020	1020	980
29-02-2020	1040	960
31-03-2020	1050	940

You are required to find out:

- (i) Earnings of Mr. A through Stock Lending Scheme in both the scenarios.
- (ii) Total Earnings of Mr. A during 01-01-2020 to 31-03-2020 in both the scenarios.
- (iii) What is the profit or loss to M/s. XYZ by shorting the shares using Stock Lending Scheme, in both the scenarios?

Solution

Question (i): Earnings of Mr. A from Stock Lending:

Date	Scenario 1			Scenario 2		
	Value per Share	Total Value of 1000 Shares	Lending Fee @ 1%	Value per Share	Total Value of 1000 Shares	Lending Fee @ 1%
31-01-2020	1020	10,20,000	10,200	980	9,80,000	9,800
29-02-2020	1040	10,40,000	10,400	960	9,60,000	9,600
31-03-2020	1050	10,50,000	10,500	940	9,40,000	9,400
Total			31,100			28,800

Question (ii): Total Earnings of Mr. A:

Particulars	Scenario 1	Scenario 2
Income from Stock Lending	31,100	28,800
Dividends @ 25% (Rs. 100 X 25% X 1000 Shares)	25,000	25,000
	56,100	53,800

Question (iii): Profit or Loss to M/s XYZ Ltd:

Particulars	Scenario 1	Scenario 2
<u>Gain or Loss from Shorting (See Note):</u> Scenario 1: (1000-1050) X 1000 Shares Scenario 2: (1000 – 940) X 1000 Shares	(50,000)	60,000
<u>Bank Guarantee Charges</u> (1000 Shares X Rs. 1000 per share X 8% X 3/12)	(20,000)	(20,000)
Lending Fees paid	(31,100)	(28,800)
Net Gain/Loss to XYZ Ltd.	(1,01,100)	11,200

Note: Shorting refers to 'selling now and buying later'. XYZ Ltd., shorted on 1st January 2020 when the share price was Rs. 1000. So, the selling price per share is Rs. 1000. It buys back on 31-03-2020. An increase in share price results in 'loss' and a fall in share price results in 'profits' to XYZ Ltd.

Question 3(a) [8 Marks]:

On 1st April, an open-ended scheme of mutual fund had 400 lakh units outstanding with Net Assets Value (NAV) of Rs. 19. At the end of April, it issued 5 lakh units at opening NAV plus 2% load, adjusted for dividend equalization. At the end of May, 4 lakh units were repurchased at opening NAV less 2% exit load adjusted for dividend equalization. At the end of June, 60% of its available income was distributed.

In respect of April – June quarter, the following additional information are available:

	Rs. In lakhs
Portfolio value appreciation	515.670
Income of April	31.960
Income for May	46.125
Income for June	58.470

You are required to calculate:

- Income available for distribution;
- Issue price at the end of April;
- Repurchase price at the end of May; and
- Net asset value (NAV) as on 30th June.

Solution

NAV on 30th June	Rs. Lakhs
Net Assets on 1st April (400 Lakh Units X Rs. 19)	7600.0000
Appreciation in Portfolio	515.6700
Income during the quarter	136.5550
Inflow on issue of units (See Working Note No. 1)	97.2995
outflow on repurchase of units (See Working Note No. 2)	-75.2552
outflow on distribution of income (See Working Note No. 3)	-81.7076
NET ASSETS ON 30TH JUNE	8192.5617
Number of Units (400 Lakhs + 5 Lakhs - 4 Lakhs)	401.000
NAV per unit	20.4303

Working Note No. 1 (Inflow on issue of units)	Rs.
<u>Issue Price per unit:</u>	
Opening NAV	19.0000
Add: Entry Load @ 2%	<u>0.3800</u>
	19.3800
Add: Dividend Equalisation	
(Rs. 31.96 Lakhs /400 Lakh)	<u>0.0799</u>
Issue Price per unit	<u>19.4599</u>
Number of Units issued	5 Lakhs
Total Proceeds on Issue (Rs. in Lakhs)	97.2995

Working Note No. 2 (Outflow on repurchase of units)	Rs.
<u>Repurchase Price per unit:</u>	
Opening NAV	19.0000
Less: Exit Load @ 2%	<u>0.3800</u>
	18.6200
Add: Dividend Equalisation	
Share of Income of April	
(Rs. 31.96 Lakhs / 400 Lakh units)	0.0799
Share of Income of May	
(Rs. 46.125 Lakhs / 405 Lakh Units)	<u>0.1139</u>
Repurchase Price per Unit	<u>18.8138</u>
Number of Units repurchased	4 Lakhs
Outflow on Repurchase (Rs. in Lakhs)	75.2552

Working Note No.3 (Income available for distribution)	Rs. in Lakhs
Income earned during the quarter	136.5550
Add: Dividend equalisation on issue of units (0.0799 X 5 Lakh Units)	0.3995
Less: Dividend equalisation on repurchase of units (0.0799 + 0.1139) X 4 Lakh Units	<u>-0.7752</u>
Income available for Distribution	<u>136.1793</u>
Amount distributed – 60% of Rs. 136.1793 Lakhs	81.7076

Question 3(b) [8 Marks]:

B Ltd., wants to acquire S Ltd., and has offered a swap ratio of 2:3 (2 shares for every 3 shares of S Ltd.). Following information is available:

Particulars	B Ltd.	S Ltd.
Profit after tax (Rs.)	21,00,000	4,50,000
Equity shares outstanding (Nos.)	6,00,000	1,80,000
EPS (in Rs.)	3.50	2.50
PE Ratio	10 times	7 times
Price quoting per share on BSE before the merger announcement	35	17.5

Required:

- The number of equity shares to be issued by B Ltd., for acquisition of S Ltd.
- What is the EPS of B Ltd., after the acquisition?
- Determine the equivalent earnings per share of S Ltd., and calculate per share gain or loss to shareholders of S Ltd.
- What is the expected market price per share of B Ltd., after the acquisition, assuming its PE multiple remains unchanged?
- After the announcement of merger, price of shares of S Ltd., rose by 10% on BSE. Mr. X, an investor, having 10,000 shares of S Ltd., is having another investment opportunity, which yields annual return of 14% is seeking your advice whether he needs to offload the shares in the market or accept the shares of B Ltd.

Solution

- Number of Shares to be issued by Acquiring Firm to Shareholders of Target Firm:

$$\begin{aligned}
 \text{No. of Shares to be issued by Acquiring Firm to Target Firm} &= ER \times N_T \\
 &= 2/3 \times 1,80,000 \\
 &= \mathbf{1,20,000}
 \end{aligned}$$

- Post-Merger EPS of Acquiring Firm:

$$EPS_{AT} = E_{AT} / N_{AT}$$

In this case,

$$E_{AT} = \text{Rs. } 21,00,000 + \text{Rs. } 4,50,000 = \text{Rs. } 25,50,000$$

$$N_{AT} = N_A + (ER \times N_T) = 6,00,000 + (2/3 \times 1,80,000) = 7,20,000 \text{ Shares}$$

$$\text{So, } EPS_{AT} = \text{Rs. } 25,50,000 / 7,20,000 \text{ Shares} = \mathbf{\text{Rs. } 3.5416 \text{ or Rs. } 3.54}$$

- Equivalent EPS of Target Firm:

$$\begin{aligned}
 \text{Equivalent EPS} &= \text{Pre-merger EPS of Target Firm} / \text{Exchange Ratio} \\
 &= \frac{\text{Rs. } 2.50}{\frac{2}{3}} = \mathbf{\text{Rs. } 3.75}
 \end{aligned}$$

- Post-merger Market Price per Share

$$MPS_{AT} = EPS_{AT} \times PE_{AT}$$

$$\text{So, } MPS_{AT} = \text{Rs. } 3.54 \times 10 = \mathbf{\text{Rs. } 35.40}$$

(v) Market Value of Merged Entity

$$\begin{aligned} MV_{AT} &= N_{AT} \times MPS_{AT} \\ &= 7,20,000 \text{ Shares} \times \text{Rs. } 35.40 \\ &= \text{Rs. } 2,54,88,000 \end{aligned}$$

OR

$$\begin{aligned} MV_{AT} &= E_{AT} \times PE_{AT} \\ &= \text{Rs. } 25,50,000 \times 10 \\ &= \text{Rs. } 2,55,00,000 \end{aligned}$$

(vi) Advice to Mr. X

Price per share after merger announcement = Rs. 17.50 + Rs. 1.75 = Rs. 19.25

Revenue generated if shares are off-loaded in the market:
Immediately: 10000 Shares X Rs. 19.25 = **Rs. 1,92,500**

Annual Revenue from Investment of Rs. 1,92,500 = Rs. 1,92,500 X 14% = **Rs. 26,950**

Expected Market Price per share after merger: Rs. 35.40

So, Value of shares held by Mr. X after merger = 10000 Shares X $\frac{2}{3}$ X Rs. 35.40 = **Rs. 2,36,000**

If shares of B Ltd., are accepted, the value of shares are higher after merger as compared to the value generated if disposed off on the news of merger.

In case the shares of B Ltd., are accepted and after merger if disposed, it will generate higher investment resulting in higher annual revenues.

In case the Shares of B Ltd., are accepted and held, the benefit of synergy, higher earnings and higher dividends might be earned.

Hence, it is advisable to accept the shares from B Ltd., rather than offloading the shares in the market.

Question 4(a) [8 Marks]:

M/s Taxi Travels operators is having 108 no. of vehicles, all are running on diesel, and have the remaining lives of 3 years. To reduce the pollution the company has decided to convert all vehicles into CNG Mode or Electric Mode by modifying the existing vehicles, which will have lives of 6 years and 4 years respectively. The initial investment outlay for modification and annual operating costs are expected to be as follows:

Particulars	Diesel	CNG	Electric
Investment for modification	--	5,00,000	6,00,000
Annual operating costs	2,50,000	1,50,000	60,000
Salvage value	10,000	1,00,000	50,000

Revenue from each vehicle is expected to be Rs. 25,000 per month.

- If the hurdle rate is 12%, which system should Taxi Travels choose?
- Find out profit for each vehicle and also total profit to the company.

The PVIF @ 12% for the six years.

Year	1	2	3	4	5	6
PVIF	0.8929	0.7972	0.7118	0.6355	0.5674	0.5066

Solution

Question (i):

Particulars	Diesel	CNG	Electric
Investment Required	-	5,00,000	6,00,000
Useful Life	3 years	6 years	4 years
Annual Operating Cost	Rs. 2,50,000	Rs. 1,50,000	Rs. 60,000
Salvage value	Rs. 10,000	Rs. 1,00,000	Rs. 50,000
PV of Annuity of Re. 1 @ 12% for useful life	2.4019	4.1114	3.0374
PV of Re. 1 @ 12% at the end of useful life	0.7118	0.5066	0.6355
PV of Total Operating Cost (Annual Operating Cost X PV of Annuity of Re. 1)	Rs. 6,00,475	Rs. 6,16,710	Rs. 1,82,244
PV of Salvage (Salvage Value X PV of Re. 1 at the end of useful life)	Rs. 7,118	Rs. 50,660	Rs. 31,775
Effective Total Cost (Investment + PV of Total Operating Cost – PV of Salvage)	Rs. 5,93,357	Rs. 10,66,050	Rs. 7,50,469
Equated Effective Annual Cost <i>Effective Total Cost</i> <i>PV of Annuity of Re.1 for useful Life</i>	$\frac{Rs. 5,93,357}{2.4019}$ = Rs. 2,47,037	$\frac{Rs. 10,66,050}{4.1114}$ = Rs. 2,59,291	$\frac{Rs. 7,50,469}{3.0374}$ = Rs. 2,47,076

Although, the cost of 'Electric Mode' is slightly higher than the cost of 'Diesel Mode', since the purpose of conversion is to control the pollution, it is advisable to convert all vehicles into 'Electric System'.

Question (ii):

	CNG	ELECTRIC
Annual Revenues	300000	300000
Less: Annual Operating Cost	<u>150000</u>	<u>60000</u>
Annual Cash Inflow	150000	240000
PV of Annual Cash Inflows [Annual Cash Inflow X PV of Annuity of Re. 1 for useful Life]	616710	728976
PV of Salvage	50660	31775
Total PV of Cash Inflows	667370	760751
Less: Cash Outflow	500000	600000
Net Present Value	167370	160751
Equivalent NPV p.a. [NPV / PV of Annuity of Re.1 for Useful Life]	40709	52924
Number of Vehicles	108	108
Total Profits	4396546	5715779

Alternatively,

	CNG	ELECTRIC
Annual Revenues	300000	300000
Less: Equated Effective Annual Cost	<u>259291</u>	<u>247076</u>
Profit per annum	40709	52924
Number of Vehicles	108	108
Total Profits	4396546	5715779

Question 4(b) [8 Marks]:

Following information is available for M/s ABC Ltd.

Current Dividend Rs. 2.50 per share

Discount rate 10.5%

Growth rate 2%

(i) Calculate the present price of the share of ABC Ltd.

(ii) Is its stock overvalued, if stock price is Rs. 35? ROE = 9% and EPS = Rs. 2.25.

Solution

Question (i):

$$P_0 = \frac{D_1}{(K_e - g)} = \frac{\text{Rs. } 2.50 (1.02)}{(0.105 - 0.02)} = \text{Rs. } 30.00$$

Question (ii):

PE Multiple Approach

Book Value per Share X ROE = Earnings per Share

So, Book Value per Share = Earnings per Share / ROE

$$= \text{Rs. } 2.25 / 9\% = \text{Rs. } 25.00$$

The stock price is Rs. 35. It is over-valued.

Alternatively,

Earnings Growth Model:

$$P_0 = \frac{E_1}{(K_e - g)} = \frac{\text{Rs. } 2.25 (1.02)}{(0.105 - 0.02)} = \text{Rs. } 27.00$$

The stock price is Rs. 35. It is over-valued.

Recorded classes for the following are available at courses.vittampravinagurushala.in/learn for subscription

Sl. No.	Title of the Course	Actual Course Duration	Maximum Watch Time	Course Validity	Price (inclusive of GST)
1	Strategic Financial Management – Full Course	153 Hours	307 Hours	120 Days	Rs. 6750
2	Corporate Valuation	24 Hours	49 Hours	30 Days	Rs. 1300
3	Corporate Restructuring	22 Hours	43 Hours	30 Days	Rs. 1300
4	Corporate Valuation and Restructuring	46 Hours	92 Hours	60 days	Rs. 2400
5	Investments – Stocks, Bonds and Mutual Funds	53 Hours	107 Hours	60 days	Rs. 2400
6	Portfolio Revision, Derivatives, Interest Rate Risk	29 Hours	58 Hours	30 days	Rs. 1300
7	International Finance	22 Hours	43 Hours	30 days	Rs. 1300
8	Derivatives, Interest Rate Risk and International Finance	51 Hours	101 Hours	60 days	Rs. 2400
9	Strategic Financial Management – Problems and Solutions			60 days	Rs. 600

Note: Visit our website www.drvrk.in for the coverage under each course.

Each Course includes the following:

1. Downloadable videos on Foundations for Finance
2. Downloadable Study Material (Theory and Problems) and other resources
3. Recorded lectures on all topics under the course.
4. Solution Manual for all the problems in each topic under the course.
5. Suggested Answers for November 2020 and January 2021 Exam Papers (both Old and New Scheme)

Notes:

1. Each course contains well-researched and compiled study material. Problems have been compiled from the Study Material of the Institute, Revision Test Papers and Past Examination Question Papers.
2. Each Lecture session is for a duration of around 90 minutes.
3. Course Number 9 has all the above contents other than Recorded Lectures. Solutions for around 700 problems have been provided under this course.
4. Please visit '[Resources](http://www.drvrk.in)' page at www.drvrk.in to download SUGGESTED ANSWERS of all past CA Examination papers.

Question 5(a) [8 Marks]:

A Ltd., decided to acquire a machine costing Rs. 5,00,000. The expected life of machine is 10 years with no salvage value. Depreciation will be charged on straight line basis. Tax rate is 30%. The financial manager seeks your advice for selection between the following two alternatives using Bower-Herringer-Williamson Method, using cost of capital at the rate of 12%.

- (i) Leasing: The leasing company is expecting a minimum return of 10% on its investment in leasing business and lease payment will be received in advance.
(ii) Loan: The loan will carry interest rate of 15% and the annual instalment will be paid in advance.
(Round off all calculations to nearest whole numbers)

Present Value	t1	t2	t3	t4	t5	t6	t7	t8	t9	t10
PVIF _{0.10,t}	0.909	0.826	0.751	0.683	0.621	0.565	0.514	0.467	0.425	0.386
PVIF _{0.12,t}	0.893	0.797	0.712	0.636	0.568	0.507	0.453	0.404	0.361	0.322
PVIF _{0.15,t}	0.870	0.757	0.658	0.572	0.497	0.432	0.376	0.327	0.284	0.247

Solution

1. Effective cost of the Asset to the Leasing Company:

	Rs.
Cost of the Machine	5,00,000
Less: PV of Tax Savings on account of Depreciation	
$\frac{\text{Cost of the Asset} - \text{Salvage}}{\text{Useful Life}} \times \text{Tax Rate} \times \text{PV of Annuity of Re.1 @ 10\% for 10 Years}$	
$\left[\frac{\text{Rs. } 5,00,000 - \text{Nil}}{10} \times 30\% \times 6.147 \right]$	92,205
Effective Cost of the Asset	4,07,795

2. Calculation of Lease Rent p.a.:

Company is subject to Tax and the lease rent is payable in advance.

So, Lease Rent is calculated using the following formula:

Lease Rent p.a. $\times (1-T)$ $\times$ PV of Annuity of Re.1 = Effective cost of the Asset

That is,

$$\text{Lease Rent p.a.} = \frac{\frac{\text{Effective cost of the Asset}}{\text{PV of Annuity of Re.1}}}{(1-T)}$$

Since, Lease rent is payable in advance, the PV of Annuity of Re. 1 @ 10% for 10 years = $(1 + \text{PV of Annuity of Re. 1 @ 10\% for 9 years}) = 1 + 5.761 = \mathbf{6.761}$

Therefore,

$$\text{Lease Rent p.a.} = \frac{\text{Rs. } 4,07,795}{\frac{6.761}{(1-0.3)}} = \text{Rs. } 86,165.40 = \text{Rs. } 86,165$$

3. Calculation of Present Value of Lease Rent and Tax Benefit for A Ltd:

Lease Rent p.a. payable in advance = Rs. 86,165

Hurdle Rate: 12%

PV of Annuity of Re. 1 @ 12% for 10 years = 1 + PV of Annuity of Re. 1 @ 12% for 9 years
= 1 + 5.331 = 6.331

So, PV of Lease Rent = Rs. 86,165 X 6.331 = **Rs. 5,45,511** (rounded off)

Tax Savings on account of Lease Rent p.a. = Rs. 86,165 X 30% = Rs. 25,850

Since Tax computation is made at the end of the year, the present value of tax savings must be considered as 'in arrears.'

So, PV of Tax Savings on account of Lease Rent
= Lease Rent p.a. X Tax Rate. X PV of Annuity of Re. 1 @ 12% for 10 Years
= Rs. 86,165 X 30% X 5.653 = **Rs. 1,46,127** (rounded off)

4. Calculation of Equated Annual Installment in case of buying the asset out of Borrowings:

$$\text{Equated Annual Installment} = \frac{\text{Loan Amount}}{\text{PV of Annuity of Re.1 @ interest rate for the period of Loan}}$$

Loan Amount = cost of the machine = Rs. 5,00,000

Rate of Interest = 15%

Period of Loan = 10 years (assumed to be same as the useful life of the machine)

Since the instalment is payable in advance, the PV of Annuity is-

PV of Annuity of Re. 1 @ 15% for 10 years
= 1 + PV of Annuity of Re. 1 @ 15% for 9 Years
= 1 + 4.773 = **5.773**

$$\text{Therefore, Equated Annual Installment} = \frac{\text{Rs. } 5,00,000}{5.773} = \text{Rs. } 86,610 \text{ (rounded off)}$$

Present Value of Cash Outflows

= Equated Annual Installment X PV of Annuity of Re. 1 @ 12% for 10 years
= Rs. 86,610 X (1+5.331)
= Rs. 86,610 X 6.331
= **Rs. 5,48,328**

5. Preparation of Loan Repayment Schedule:

Year	Loan amount outstanding at the beginning of the year	Equated Annual Instalment	Loan amount outstanding at the beginning of the year after payment of EAI	Interest @ 15%	Balance Loan amount Outstanding at the end of the year
1	500000	86610	413390	62009	475399
2	475399	86610	388789	58318	447107
3	447107	86610	360497	54075	414571
4	414571	86610	327961	49194	377155
5	377155	86610	290545	43582	334127
6	334127	86610	247517	37128	284645
7	284645	86610	198035	29705	227740
8	227740	86610	141130	21170	162300
9	162300	86610	75690	11353	87043
10	87043	87043*	0	0	0

* On account of rounding off of the installment amount, there is a difference of Rs. 433 in the last installment. Hence, the last installment is shown as equal to the loan amount outstanding.

6. Calculation of Tax Savings on account of Depreciation and Interest on Loan:

Year	Depreciation	Interest on Loan	Total Charge	Tax Savings @ 30%	PV of Re. 1 @ 12%	PV of Tax Savings
1	50000	62009	112009	33603	0.893	30007
2	50000	58318	108318	32495	0.797	25899
3	50000	54075	104075	31222	0.712	22230
4	50000	49194	99194	29758	0.636	18926
5	50000	43582	93582	28075	0.568	15946
6	50000	37128	87128	26138	0.507	13252
7	50000	29705	79705	23912	0.453	10832
8	50000	21170	71170	21351	0.404	8626
9	50000	11353	61353	18406	0.361	6645
10	50000	0	50000	15000	0.322	4830
						157193

7. Evaluation under Bower-Herringer-Williamson Method:

Financial Flows		Operational Flows	
Investment outlay (Not spent)	5,48,328	Present Value of Tax Benefits on Lease Rentals	1,46,127
Present Value of Lease Rentals	(5,45,511)	<i>Foregoing by not borrowing:</i>	
		- Present value of interest tax shield and Depreciation	(1,57,193)
		- Present value of salvage	Nil
Total	2817	Total	(11,066)

Since, the 'Net Financial Flows' are Positive, leasing has 'financial advantage.'

Since, the 'Net Operational Flows' are Negative, leasing has 'operational disadvantage.'

The sum of 'Net Financial Flows' and 'Net Operational Flows' is-
Rs. 2817 + Rs. (11,066) = **Rs. (-) 8,249**

Since the 'Net Cash Flows' are **negative**, Leasing is not advantageous. Hence, it is advisable to **buy the machine** out of borrowed funds.

Question 5(b) [8 Marks]:

(i) Interest rates for 3 months in USA and Canada are as follows:

Currency	Borrow	Invest
US \$	4%	2.5%
Canadian \$	4.5%	3.5%

(ii) Can \$/US \$ Spot: 1.235 – 1.240
3 months forward 1.255 – 1.260

Advice, the currency in which borrowing and lending for 3 months needs to be done for the US company. Take 3 months = 90/360 days.

Solution

The quotation given is Canadian \$ per US \$. Assuming it is a direct quotation, Canadian \$ is considered as Home Currency and US \$ as Foreign Currency.

Step 1: Actual R_h

Actual R_h = 3.5% (for Investment) and 4.5% (for Lending)

Step 2: Theoretical R_h

$$\frac{F}{S} = \frac{\left(1 + \frac{rh}{f}\right)}{\left(1 + \frac{rf}{f}\right)}$$

For Lending - based on Bid-rate:

$$\frac{1.255}{1.235} = \frac{\left(1 + \frac{rh}{4}\right)}{\left(1 + \frac{0.045}{4}\right)}$$

So,

$$r_h = \left[\left(\frac{1.255}{1.235} \times 1.01125\right) - 1\right] \times 4 = 0.1105 = \mathbf{11.05\%}$$

For Investing – based on Ask-Rate:

$$\frac{1.260}{1.240} = \frac{\left(1 + \frac{rh}{4}\right)}{\left(1 + \frac{0.035}{4}\right)}$$

So,

$$r_h = \left[\left(\frac{1.260}{1.240} \times 1.00875\right) - 1\right] \times 4 = 0.1000 = \mathbf{10\%}$$

Step 3: Scope for Arbitrage

Since Actual $R_h \neq$ Theoretical R_h , there is scope for Arbitrage.

Step 4: Strategy

Actual R_h is less than Theoretical R_h .

Hence, Funds must be borrowed in Home Country and invested in Foreign Country to take advantage of the arbitrage opportunity.

Operations:

Borrow 100000 C\$ @ 4.5% p.a., for 3 months.

Convert 100000C\$ into US \$ @ 1.24C\$ per US \$ and receive: 80645.16 US \$

Invest 80645.16 US \$ @ 2.5% for 3 months

Realise after 3 months: $80645.16 + (80645.16 \times 2.5\% \times 3/12) = 81149.19$ US \$

Convert 81149.19 US \$ into C\$ @ 1.255 C\$ per US \$ and receive: 101842.23C\$

Repay the borrowing of 100000C\$ with Interest: $100000 + (100000 \times 4.5\% \times 3/12) = 101125$ C\$

Surplus: **717.23C\$** for every 100000C\$

Question 6(a) [8 Marks]:

M/s A Ltd., is planning to import an equipment from Japan at a cost of 3,400 Lakh Yens. The company may avail loans at 18% p.a., interest with quarterly rests with which it can import the said equipment. The company has also an offer from Osaka branch of an Indian bank extending credit of 180 days at 2% p.a. against opening of an irrevocable letter of credit (L/C).

Additional Information:

Present Exchange Rate: Rs. 100 = 340 yen

180 days forward rate: Rs. 100 = 345 yen

Commission charges for L/C at 2% per 12 months.

Advice whether the company should accept the offer

Solution

Option 1: Financing the equipment with borrowing at 18% interest p.a.:

Cost of the Equipment	3400 Lakh Yen
Equivalent cost of Equipment in Indian Rupees Rs. 3400 Lakh Yen / 340 Yen per 100 Rupees)	1000 Lakh Rs.
Loan amount required	1000 Lakh Rs.
Rate of Interest p.a.	18%
<u>Amount repayable at the end of 180 days:</u>	In Lakh Rs.
Loan Amount	1000.000
Interest for Quarter 1 (1000 Lakhs X 18% X 3/12)	45.000
	1045.000
Interest for Quarter 2 (1045 Lakhs X 18% X 3/12)	47.025
Cash Outflow if the equipment is financed out of borrowings	1092.025

Option 2: Financing the equipment through Letter of Credit offer of Foreign Branch:

<u>Cost of the offer (in Rs.):</u>	<u>Rs. In Lakhs</u>
Commission for Letter of Credit (Rs. 1000 Lakhs X 2% X 180 / 360)	10.000
Add: Interest @ 18% for 180 days (Rs. 10 Lakhs X 18% X 180 / 360)	0.90
	10.90
<u>Total Cash Outflow under the offer:</u>	
Cost of the Equipment	3400 Lakh Yen
Add: Interest @ 2% p.a. (3400 Lakh Yen X 2% X 180 / 360)	34 Lakh Yen
	3434 Lakh Yen
Amount of INR required for payment of 3434 Lakh Yen after 180 days [3434 Lakh Yen / 345 Yen per 100 Rupees)	995.36 Lakh Rs.
Add: Cost of Letter of Credit	10.90 Lakh Rs.
Total Cash Outflow	1006.26 Lakh Rs.

* Students can consider 365 days instead of 360 days in a year. In such case, there will be a small variation in the answer.

Suggestion: Since the Total Cash Outflow is lower in case of offer from Bank at Osaka, it is advisable to consider the same.

Question 6(b) [8 Marks]:

The credit sales and receivables of M/s X Ltd., at the end of the year are estimated at Rs. 4,00,00,000 and Rs. 50,00,000 respectively. The average variable overdraft interest rate is 5%. X Ltd., is considering a proposal for assigning to a Factor, the collections of its debts on a non-recourse basis at an annual fee of 3% on credit sales. As a result, X Ltd., will save Rs. 1,00,000 per year in its administrative cost and Rs. 3,50,000 for its bad debts. The factor will maintain a receivable collection period of 30 days and advance 80% of the face value thereof at an annual interest rate of 7%. Evaluate the viability of proposal. Assume 365 days in a year.

Solution

Total Sales for the year:	Rs. 4,00,00,000
Credit Period under Factoring proposal:	30 days
Investment in Receivables:	Rs. 400,00,000 X 30 days / 365 days = Rs. 32,87,671.
Current investment in Receivables:	Rs. 50,00,000
Reduction in Investment in Receivables	Rs. 17,12,329
Amount advanced by Factor	80% of Rs. 32,87,671 = Rs. 26,30,137

	Rs.
Costs of Factoring (Annualised)	
Factoring Charges- Annualised (3% of Rs. 400,00,000)	12,00,000
Interest on advance	
Annualised – (Rs. 26,30,137 X 7%)	1,84,110
	13,84,110
Benefits of Factoring	
Reduction in Finance Cost (Rs. 17,12,329 X 5%)	85,616
Savings in Bad Debts	3,50,000
Savings in Administration Cost	1,00,000
Savings in interest on overdraft (Rs. 26,30,137 X 5%)	1,31,507
	6,67,123
Net Benefit of Factoring	(7,16,987)

The Net benefit is negative. That is, Factoring option results in an increase in the cost of managing receivables by Rs. 7,16,987. Hence, it is not advisable for M/s. X Ltd., to consider the proposal of the Factor.

Question 7(a) [4 Marks]:

What is takeover by reverse bid or reverse merger?

Answer

When the smaller company gains control of a larger one then it is called "Take-over by reverse bid". This concept has been successfully followed for revival of sick industries. The concept of take-over by reserve bid, or of reserve merger, is thus not the usual case of amalgamation of a sick unit which is non-viable with a healthy or prosperous unit but is a case whereby the entire, undertaking of the healthy and prosperous company will be merged and vested in the sick company which is non-viable. Under the Sick Industrial Companies (Special Provision)

Act, 1985, a company becomes a sick industrial company when there is erosion of its net worth.

The three 'tests' in a takeover by reserve bid that are required to be satisfied are, namely, (i) the assets' of the transferor company are greater than the transferee company; (ii) equity capital to be issued by the transferee company pursuant to the acquisition exceeds its original issued capital, and (iii) the change of control in the transferee company will be through the introduction of minority holder or group of holders.

In reserve takeover control goes to the shareholders (and usually management) of the company that is formally the target of the bid.

The term reserve takeover is also applied to the purchase of a listed company by an unlisted company with control passing to the shareholders and management of the unlisted company. This is sometimes known as a 'back door listing'.

A reserve takeover will almost always take place by way of a pure equity acquisition, also called a share swap.

A reserve takeover for the purpose of obtaining a back door listing is accomplished by the shareholders of the unlisted company selling all of their shares to the listed company in exchange for shares of the listed company.

This is a cost-effective method of obtaining a public listing because it avoids the expenses associated with floatation. Sometimes, the unlisted company usually takeover a listed company, a company i.e., listed but not actively traded on the stock exchange.

Question 7(b) [4 Marks]:

Write a short note on Euro Convertible Bonds.

Answer

A convertible bond is a debt instrument which gives the bond holders an option to convert the bond into a predetermined number of equity shares of the company. Usually, the price of the equity shares at the time of conversion will have a premium element. The bonds carry a fixed rate of interest. The issue of such bonds may carry two options viz, call options and Put option. In case of call option, the issuer company has the option of calling (buying) the bonds for redemption before the date of maturity of the bonds. Put option gives the holder of the bonds rights to sell his bonds back to issuer company at predetermined price and date. In case of Euro-convertible bonds the payment of interest on and the redemption of bonds will be made by the issuer company in US dollars.

Question 7(c) [4 Marks]:

Explain the different levels of strategy.

Answer

Strategy is an actionable plan to achieve sustainable competitive advantage. Strategies are of different types, viz.,

- a. Corporate level strategies;
- b. Business level strategies; and
- c. Operational level strategies.

Corporate level strategies are about what the organisation should do. They are long-term in nature and formulated occasionally.

Business level strategies are about how the achieve what the organisation wants to do. They are medium term in nature and are formulated frequently.

Operational level strategies are about 'actual doing'. They are short-term in nature and highly frequent.

Question 7(d) [4 Marks]:

Write any four differences between 'systematic risk' and 'unsystematic risk.'

Answer

Systematic Risk	Unsystematic Risk
Systematic Risk is the variability in stock returns on account of variation in the market. Hence, it is also called 'Market Risk' or 'Explained Risk'	Unsystematic Risk is the variability in stock return for all other reasons. Hence, it is also called 'Residual Risk' or 'Random Error' or 'Unexplained Risk'
It is calculated with the help of Beta	There is no measure for its calculation since it is a residual error
This risk cannot be eliminated since stock always has to be part of market. Hence, it is also called 'Unavoidable risk' or 'non-diversifiable risk'	This risk can be eliminated with proper portfolio construction and management. Hence, it is also called 'avoidable risk' or 'diversifiable risk'
It is calculated using this formula: $\beta_i^2 \sigma_m^2$	There is no formula for its calculation. It is ascertained by deducing 'systematic variance' from the 'total variance'. So, Unsystematic risk (σ_{ei}^2) = $\sigma_i^2 - \beta_i^2 \sigma_m^2$

Question 7(e) [4 Marks]:

State the assumptions of Black-Scholes Model

Answer

Black-Scholes Model is used in 'option-pricing.' Following are the assumptions underlying Black-Scholes Model:

1. The rate of return on shares is log normally distributed. (The logarithm of Stock's return will follow normal distribution)
2. The risk-free rate is constant during the life of the option and is known.
3. The Market is efficient and there is no transaction costs and taxes.
4. The call option is a European option.
5. There are no restrictions or penalties for short selling.
6. The stock price is continuous and random.
7. There is no dividend to be paid on share during the life of the option.