SUGGESTED SOLUTION

CA FINAL NOV'19

SUBJECT- SFM

Test Code – FNJ 7195

BRANCH - () (Date :)

Answer 1:

(i)   Working Notes:

Present Value of Cash Flows (CF) upto 5 years

Year End	CF of Yes Ltd.(Rs. lakhs)	PVF@15%	PV of CF(Rs. lakhs)	CF of Merged Entity(Rs. lakhs)	PV of CF of Merged Entity(Rs. lakhs)
1	175	0.870	152.25	400	348.00
2	200	0.756	151.20	450	340.20
3	320	0.658	210.56	525	345.45
4	340	0.572	194.48	590	337.48
5	350	0.497	173.95	620	308.14
			882.44		1679.27

(4 marks)

$$TV_5 = \frac{CF_5(1+g)}{K_e - g} = \frac{350(1+0.05)}{0.15 - 0.05} = \frac{367.50}{0.10} = ₹\ 3675\ lakhs$$

PV of TV_5 = ₹ 3675 lakhs x 0.497 = ₹ 1826.475 lakhs

PV of Cash Flows of Merged Entity after the forecast period

$$TV_5 = \frac{CF_5(1+g)}{K_e - g} = \frac{620(1+0.06)}{0.15 - 0.06} = \frac{657.20}{0.09} = ₹\ 7302.22\ lakhs$$

PV of TV_5 = ₹ 7302.22 lakhs x 0.497 = ₹ 3629.20 lakhs

(1.5 mark)

Value of Yes Ltd.

	Before merger (Rs. lakhs)	After merger (Rs. lakhs)
PV of CF (1-5 years)	882.440	1679.27
Add: PV of TV5	1826.475	3629.20
	2708.915	5308.47

(1.5 mark)

(ii)   Value of Acquisition

= Value of Merged Entity – Value of Yes Ltd.

= Rs. 5308.47 lakhs – Rs. 2708.915 lakhs = Rs. 2599.555 lakhs   **(1 mark)**

(iii) Gain to Shareholders of Yes Ltd.

Share of Yes Ltd. in merged entity = Rs. 5308.47 lakhs x $\dfrac{1}{1.5}$ = Rs. 3538.98 lakhs

Gain to shareholder = Share of Yes Ltd. in merged entity – Value of Yes Ltd. before merger

Answer 2:

(i)   Portfolio Beta

        0.20 x 0.40 + 0.50 x 0.50 + 0.30 x 1.10 = 0.66   **(1 mark)**

(ii)   Residual Variance

        To determine Residual Variance first of all we shall compute the Systematic Risk as follows:

$$\beta_A^2 \text{ x } \sigma_M^2 = (0.40)^2 (0.01) = 0.0016$$

$$\beta_B^2 \text{ x } \sigma_M^2 = (0.50)^2 (0.01) = 0.0025$$

$$\beta_C^2 \text{ x } \sigma_M^2 = (1.10)^2 (0.01) = 0.0121 \qquad \textbf{(2 marks)}$$

        Residual Variance

        A   0.015 – 0.0016 = 0.0134

        B   0.025 – 0.0025 = 0.0225

        C   0.100 – 0.0121 = 0.0879   **(2 marks)**

(iii)   Portfolio variance using Sharpe Index Model

        Systematic Variance of Portfolio = $(0.10)^2$ x $(0.66)^2$ = 0.004356   **(1 mark)**

        Unsystematic Variance of Portfolio

        = 0.0134 x $(0.20)^2$ + 0.0225 x $(0.50)^2$ + 0.0879 x $(0.30)^2$ = 0.014072   **(1 mark)**

            Total Variance = 0.004356 + 0.014072 = 0.018428   **(1 mark)**

(iv)   Portfolio variance on the basis of Markowitz Theory

        Portfolio Variance = $w_A^2 \sigma_A^2 + w_B^2 \sigma_B^2 + w_C^2 \sigma_C^2 + 2w_A w_B$ cov (A, B) + $2w_A w_C$ cov (A, C)

                + $2w_B w_C$ cov (B, C)   **(1 mark)**

              = $(0.2)^2$ × 0.015 + $(0.5)^2$ × 0.025 + $(0.30)^2$ × 0.100 + 2 × 0.2 × 0.5 × 0.002

              + 2 × 0.2 × 0.3 × 0.0044 + 2 × 0.5 × 0.3 × 0.0055

              = 0.0006 + 0.00625   + 0.009 + 0.0004 + 0.000528   + 0.00165

              = 0.018428   **(1 mark)**

Answer 3:

(A)

Compute Value of Equity

Simple Ltd.

	High Growth	Medium Growth	Slow Growth
Debit + Equity	820	550	410
Less: Debt	460	460	460
Equity	360	90	-50

(1 mark)

Since the Company has limited liability the value of equity cannot be negative therefore the value of equity under slow growth will be taken as zero because of insolvency risk and the value of debt is taken at 410 lacs. The expected value of debt and equity can then be calculated as:

Simple Ltd.

Rs. in Lacs

	High Growth		Medium Growth		Slow Growth		Expected Value
	Prob.	Value	Prob.	Value	Prob.	Value	
Debt	0.20	460	0.60	460	0.20	410	450
Equity	0.20	360	0.60	90	0.20	0	126
		820		550		410	576

(2 marks)

Dimple Ltd.

Rs. in Lacs

	High Growth		Medium Growth		Slow Growth		Expected Value
	Prob.	Value	Prob.	Value	Prob.	Value	
Equity	0.20	985	0.60	760	0.20	525	758
Debt	0.20	65	0.60	65	0.20	65	65
		1050		825		590	823

(2 marks)

Expected Values

Equity		Debt	
Simple Ltd.	126	Simple Ltd.	450
Dimple Ltd.	758	Dimple Ltd.	65
	884		**515**

(1 mark)

(B)

Return of the stock under APT

Factor	Actual value in %	Expected value in %	Difference	Beta	Diff. x Beta
GNP	7.70	7.70	0.00	1.20	0.00
Inflation	7.00	5.50	1.50	1.75	2.63
Interest rate	9.00	7.75	1.25	1.30	1.63
Stock index	12.00	10.00	2.00	1.70	3.40
Ind. Production	7.50	7.00	0.50	1.00	0.50
					8.16
Risk free rate in %					9.25
Return under APT					17.41

(4 marks)

Answer 4:

(i) SWAP ratio based on current market prices:

EPS before acquisition:

Mani Ltd. : Rs.2,000 lakhs / 200 lakhs: Rs.10

Ratnam Ltd.: Rs.4,000 lakhs / 1,000 lakhs: Rs. 4

Market price before acquisition:

Mani Ltd.: Rs.10 × 10   Rs.100

Ratnam Ltd.: Rs.4 × 5   Rs. 20

SWAP ratio: 20/100 or 1/5 i.e.   0.20   **(3 marks)**

(ii) EPS after acquisition:

$$\frac{Rs.(2,000 + 4,000) \text{ Lakhs}}{(200 + 200) \text{ Lakhs}}$$

= Rs. 15.00   **(2 marks)**

(iii) Market Price after acquisition:

EPS after acquisition:	Rs.15.00
P/E ratio after acquisition 10 × 0.9	9
Market price of share (Rs. 15 X 9)	Rs.135.00

(2 marks)

(iv) Market value of the merged Co.:

Rs.135 × 400 lakhs shares   Rs. 540.00 Crores

or Rs. 54,000 Lakhs

Rs. Crore

	Mani Ltd.	Ratnam Ltd.
Total value before Acquisition	200	200
Value after acquisition	270	270
Gain (Total)	70	70
No. of shares (pre-merger) (lakhs)	200	1,000
Gain per share (Rs.)	35	7

(3 marks)

Answer 5:

We have $E_p = W_1E_1 + W_3E_3 + \ldots\ldots\ldots W_nE_n$

and for standard deviation $\sigma^2_p \sum\limits_{i=1}^{n}\sum\limits_{j=1}^{n} w_i\, w_i\, \sigma_{ij}$

$\sigma^2_p \sum\limits_{i=1}^{n}\sum\limits_{j=1}^{n} w_i\, w_j\, \rho_{ij}\sigma_i\, \sigma_j$

Two asset portfolio

$$\sigma^2_p = w^2_1 w^2_1 + w^2_2\sigma^2_2 + 2w_1\, w_2\sigma_1\, \sigma_2\, \rho_{12}$$

Substituting the respective values we get,

(i) All funds invested in B

Ep = 12%

σ_p = 10%

(ii) 50% of funds in each of B & D

Ep = 0.50X12%+0.50X20%=16%

σ^2_p = $(0.50)^2(10\%)^2 + (0.50)^2(18\%)^2 + 2(0.50)(0.50)(0.15)(10\%)(18\%)$

σ^2_p = 25 + 81 + 13.5 = 119.50

σ_p = 10.93%

(iii)   75% in B and 25% in D

Ep = 0.75%X12%+0.25%X20=14%

$\sigma_p^2 = (0.75)^2(10\%)^2 + (0.25)^2(18\%)^2 +2(0.75)(0.25)(0.15)(10\%)(18\%)$

$\sigma_p^2 = 56.25 + 20.25 + 10.125 = 86.625$

σ_p = 9.31%

(iv)   All funds in D

Ep = 20%

σ_p = 18.0%

Portfolio	(i)	(ii)	(iii)	(iv)
Return	12	16	14	20
σ	10	10.93	9.31	18

In the terms of return, we see that portfolio (iv) is the best portfolio. In terms of risk we see that portfolio (iii) is the best portfolio.   **(2.5 marks x 4 = 10 marks)**