



FINAL – November 2017

PAPER 2 : SFM

Test Code: PR 2
(Date : 27.9.17)

(100 Marks)

Note: Question No.1 is compulsory. Candidates are required to answer any five questions from the remaining six questions.

Wherever necessary, suitable assumptions may be made and disclosed by way of a note.

Working notes should form part of the answers.

Question 1

a.

1.

$$R_f = \frac{6}{120} \times 100 = 5\%$$

Applying CAPM

$$12\% = 5\% + \beta(12\% - 5\%)$$

$$7\% = \beta(7\%) \quad \beta = 1$$

$$\beta = \frac{\text{Cov}(r,m)}{\sigma_m^2}$$

$$1 = \frac{196}{\sigma_m^2}$$

$$\sigma_m^2 = 196$$

$$\sigma_m = \sqrt{196} = 14$$

Standard Deviation of Market Return = 14

(3 marks)

2.

$$\text{Cor.} = \frac{\text{Cov}(r,m)}{\sigma_m \sigma_r}$$

$$0.80 = 196 / 14 \sigma_r$$

$$\sigma_r = 17.50\%$$

Standard Deviation of Security Return = 17.50%

(2 marks)

b.

Particulars		MF 'A'	MF 'B'	MF 'C'
Investments		`1,00,000	`2,00,000	`2,00,000
Opening NAV		`10.30	`10.00	`10.10
No. of units (1 mark)	(a/b)	9,708.74	20,000	19,801.98
Unit NAV ON 31-3-2016		`10.25	`10.15	`10.00
Total NAV on 31-3-2016 (1 mark)	(c x d)	`99,514.59	`2,03,000	`1,98,019.86
Increase / Decrease of NAV (1 mark)	(a-e)	(`485.41)	`3,000	(`1,980.14)
Dividend Received		`2,850	`4,500	Nil
Total yield (1 mark)	(f + g)	`2,364.59	`7,500	(`1,980.20)
Number of Days		152	60	31
Effective yield p.a. (h/a x 365/i x 100) (1 mark)		5.678%	22.813%	(-) 11.657%

c. (5 marks)

Qtrs.	Sensex	Sensex Return (%)	Amount Payable (Rs. Crore)	Fixed Return (Receivable) (Rs. Crore)	Net (Rs. Crore)
(1)	(2)	(3)	(4)	(5)	(5) – (4)
0	21,600	-		-	
1	21,860	1.2037	4.8148	4.6000	- 0.2148
2	21,780	-0.3660	-1.4640	4.6000	6.0640
3	22,080	1.3774	5.5096	4.6000	- 0.9096
4	21,960	-0.5435	-2.1740	4.6000	6.7740

d.

1. Current Market Price of Bond

(2 marks)

Time	CF	PVIF 8% PV (CF)	PV (CF)
1	14	0.926	12.964
2	14	0.857	11.998
3	14	0.794	11.116
4	14	0.735	10.290
5	114	0.681	<u>77.634</u>
		$\sum PV (CF) \text{ i.e. } P_0 =$	<u>124.002</u>

Say

`124.00

2. Minimum Market Price of Equity Shares at which Bondholder should exercise conversion option: $124 / 40 = 6.20$

(1 mark)

3. Duration of the bond

(2 marks)

Year	Cash flow	P.V. @ 8%		Proportion of bond value	Proportion of bond value x time (years)
1	14	0.926	12.964	0.105	0.105
2	14	0.857	11.998	0.097	0.194
3	14	0.794	11.116	0.089	0.267
4	14	0.735	10.290	0.083	0.332
5	114	0.681	<u>77.634</u>	<u>0.626</u>	<u>3.130</u>
			<u>124.002</u>	<u>1.000</u>	<u>4.028</u>

Question 2

a.

Alternative I: Acquiring the asset by taking bank loan:

(3 ½ marks)

Years		1	2	3	4	5
(a)	Interest (@12% p.a. on opening balance)	300,000	240,000	1,80,000	1,20,000	60,000
	Depreciation (@ 20% WDV)	<u>500,000</u>	<u>400,000</u>	<u>320,000</u>	<u>256,000</u>	<u>204,800</u>
		800,000	640,000	500,000	376,000	264,800
(b)	Tax shield (@34%)	<u>272,000</u>	<u>217,600</u>	<u>1,70,000</u>	<u>127,840</u>	<u>90,032</u>
	Interest less Tax shield (a)-(b)	28,000	22,400	10,000	(-)7,840	(-)30,032
	Principal Repayment	<u>5,00,000</u>	<u>5,00,000</u>	<u>5,00,000</u>	<u>5,00,000</u>	<u>5,00,000</u>
	Total cash outflow	528,000	522,400	510,000	492,160	469,968
	Discounting Factor @ 14%	<u>0.877</u>	<u>0.769</u>	<u>0.675</u>	<u>0.592</u>	<u>0.519</u>
	Present Value	4,63,056	4,01,726	3,44,250	2,91,359	2,43,913

Total P.V of cash outflow = `17,44,304

Alternative II: Acquire the asset on lease basis

(3 ½ marks)

Year	Lease Rentals	Tax Shield @34%	Net Cash Outflow	Discount Factor	Present Value
1	7,00,000	2,38,000	4,62,000	0.877	4,05,174
2	7,00,000	2,38,000	4,62,000	0.769	3,55,278
3	7,00,000	2,38,000	4,62,000	0.675	3,11,850
4	7,00,000	2,38,000	4,62,000	0.592	2,73,504
5	7,00,000	2,38,000	4,62,000	0.519	2,39,778
Present value of Total Cash out flow					15,85,584

Advice: By making Analysis of both the alternatives, it is observed that the present value of the cash outflow is lower in alternative II by ` 1,58,720 (i.e. `17,44,304 – ` 15,85,584) Hence, it is suggested to acquire the asset on lease basis.

(1 mark)

b.

Expected Turnover = ` 1600 lakhs + ` 286.40 = ` 1886.40 lakhs

	` in Lacs	` in Lacs
Advance to be given: (4 marks)		
Debtors `1886.40 lakhs x 100/360	524.00	
Less: 10% withholding	52.40	
		471.60
Less: Commission 1.75%		<u>9.17</u>
Net payment		462.43
Less: Interest @14% for 100 days on ` 462.43 lacs		<u>17.98</u>
		444.45
Calculation of Average Cost: (4 marks)		
Total Commission `1886.40 lakhs x 1.75%		33.01
Total Interest ` 17.98 lacs x 360/100		<u>64.73</u>
		97.74
Less: Admin. Cost	8.00	
Saving in Bad Debts (`1886.40 lacs x 1.50% x 85%)	<u>24.05</u>	<u>32.05</u>
		65.69
Effective Cost of Factoring = 65.69/444.45 x 100		14.78%

Question 3

a.

- Forward contract:** Dollar needed in 180 days = £5,00,000 x \$ 1.96 = \$9,80,000/-
(1 mark)
- Money market hedge: Borrow \$, convert to £, invest £, repay \$ loan in 180 days**
Amount in £ to be invested = 5,00,000/1.045 = £4,78,469
Amount of \$ needed to convert into £ = £4,78,469 x \$2 = \$9,56,938
Interest and principal on \$ loan after 180 days = \$9,56,938 x 1055 = \$10,09,570

(2 marks)

3.

Call option:

Expected Spot rate in 180 days	Prem. /unit	Exercise Option	Total price per unit	Total price for £5,00,000 xi	Prob. Pi	pixi
1.91	0.04	No	1.95	9,75,000	0.30	2,92,500
1.95	0.04	No	1.99	9,95,000	0.50	4,97,500

(2 ½ marks)

2.05	0.04	Yes	2.01*	10,05,000	0.20	2,01,000
						9,91,000

* (\$1.97 + \$0.04)

Alternatively it can also be computed also

Expected Spot rate in 180 days	Prem. /unit	Exercise Option	Total price per unit	Total price for £5,00,000 xi	Prob. Pi	Pi xi
1.91	0.04	No	1.95	9,75,000	0.30	2,92,500
1.95	0.04	No	1.99	9,95,000	0.50	4,97,500
2.05	0.04	Yes	2.01*	10,05,000	0.20	2,01,000
						9,91,000
Add: Interest on Premium (\$20,000 x 5.5%)						1,100
						9,92,100

(iv) No hedge option:

Expected Future spot rate	Dollar needed Xi	Prob. Pi	Pi xi
1.91	9,55,000	0.30	2,86,500
1.95	9,75,000	0.50	4,87,500
2.05	10,25,000	0.20	2,05,000
			9,79,000

The probability distribution of outcomes for no hedge strategy appears to be most preferable because least number of \$ are needed under this option to arrange £5,00,000.

(2 ½ marks)

- (b) Yield for 9 months = 115%
Market value of Investments as on 31.03.2013 = 1,00,000/- + (1,00,000 x 115%)
= ` 2,15,000/-
Therefore, NAV as on 31.03.2013 = (2,15,000 - 1,00,000) / 10,000 = ` 20.50
(2 marks)
(NAV would stand reduced to the extent of dividend payout, being (100,000 x 10%)
= ` 10,000)
Since dividend was reinvested by Mr. X, additional units acquired
= $\frac{10,000}{20.50}$ = 487.80 units
Therefore, units as on 31.03.2013 = 10,000 + 487.80 = 10,487.80
[Alternately, units as on 31.03.2013 = (2,15,000 / 20.50) = 10,487.80]
Dividend as on 31.03.2014 = 10,487.80 x 10 x 0.2 = ` 20,975.60
Let X be the NAV on 31.03.2014, then number of new units reinvested will be

` 20,975.60/X. Accordingly 11296.11 units shall consist of reinvested units and 10487.80 (as on 31.03.2013). Thus, by way of equation it can be shown as follows:

$$11296.11 = \frac{20975.60}{X} + 10487.80$$

Therefore, NAV as on 31.03.2014 = $20,975.60 / (11,296.11 - 10,487.80)$
 = ` 25.95 (4 marks)

NAV as on 31.03.2015 = ` 1,00,000 (1+2.0217)/11296.11
 = ` 26.75 (2 marks)

Question 4

a.

(i) Financial Analysis whether to set up the manufacturing units in India or not may be carried using NPV technique as follows:

I. Incremental Cash Outflows (2 Marks)

	\$ Million
Cost of Plant and Machinery	500.00
Working Capital	50.00
Release of existing Working Capital	(15.00)
	535.00

II. Incremental Cash Inflow after Tax (CFAT)

(i) Generated by investment in India for 5 years (2 marks)

	\$ Million
Sales Revenue (5 Million x \$80)	400.00
<i>Less: Costs</i>	
Variable Cost (5 Million x \$20)	100.00
Fixed Cost	30.00
Depreciation (\$500 Million/5)	100.00
EBIT	170.00
Taxes@35%	59.50
EAT	110.50
<i>Add: Depreciation</i>	100.00
CFAT (1-5 years)	210.50
Cash flow at the end of the 5 years (Release of Working Capital)	35.00

(b) Cash generation by exports (1 mark)

	\$ Million
Sales Revenue (1.5 Million x \$80)	120.00
Less: Variable Cost (1.5 Million x \$40)	60.00
Contribution before tax	60.00
Tax@35%	21.00
CFAT (1-5 years)	39.00

(c) Additional CFAT attributable to Foreign Investment (1 mark)

	\$ Million
Through setting up subsidiary in India	210.50
Through Exports in India	39.00
CFAT (1-5 years)	171.50

III. Determination of NPV (2 marks)

Year	CFAT (\$ Million)	PVF@12%	PV(\$ Million)
1-5	171.50	3.6048	618.2232
5	35	0.5674	19.8590
			638.0822
Less: Initial Outflow			535.0000
			103.0822

Since NPV is positive the proposal should be accepted.

(8 marks)

b.

Security	No. of shares (1)	Market Price of Per Share (2)	(1) × (2)	% to total (w)	β (x)	wx
VSL	10000	50	500000	0.4167	0.9	0.375
CSL	5000	20	100000	0.0833	1	0.083
SML	8000	25	200000	0.1667	1.5	0.250
APL	2000	200	400000	0.3333	1.2	0.400
			<u>1200000</u>	1		<u>1.108</u>

Portfolio

beta

1.108 (2 marks)

(i) Required Beta

0.8

It should become (0.8 / 1.108)

72.2 % of present portfolio

If ₹ 12,00,000 is 72.20%, the total portfolio should be

₹ 12,00,000 × 100/72.20 or

₹ 16,62,050

Additional investment in zero risk should be (₹ 16,62,050 – ₹ 12,00,000) = ₹ 4,62,050 (2 marks)

Revised Portfolio will be

(ii) To increase Beta to 1.2
 108.30% of present beta
 It should become $1.2 / 1.108$
 If 1200000 is 108.30%, the total portfolio should be
 $1200000 \times 100/108.30$ or 1108033 say 1108030
 Additional investment should be (-) 91967 i.e. Divest ` 91970 of Risk Free Asset
(2 marks)

Revised Portfolio will be (2 marks)

Security	No. of shares (1)	Market Price of Per Share (2)	(1) × (2)	% to total (w)	β (x)	wx
VSL	10000	50	500000	0.4513	0.9	0.406
CSL	5000	20	100000	0.0903	1	0.090
SML	8000	25	200000	0.1805	1.5	0.271
APL	2000	200	400000	0.3610	1.2	0.433
Risk free asset	-9197	10	-91970	-0.0830	0	0
			1108030	1		1.20

Portfolio beta 1.20

Question 5

a.

1.

3 Months Interest rate is 4.50% & 6 Months Interest rate is 5% p.a. (3 marks)

Future Value 6 Months from now is a product of Future Value 3 Months now & 3 Months

Future Value from after 3 Months.

$$(1+0.05*6/12) = (1+0.045*3/12) \times (1+i_{3,6} *3/12)$$

$$i_{3,6} = [(1+0.05* 6/12) / (1+0.045 *3/12) - 1] *12/3$$

i.e. 5.44% p.a.

2. **6 Months Interest rate is 5% p.a. & 12 Month interest rate is 6.5% p.a. (5 marks)**

Future value 12 month from now is a product of Future value 6 Months from now and 6

$$\text{Months Future value from after 6 Months. } (1+0.065) = (1+0.05 \cdot 6/12) \times (1+i_{6,6} \cdot 6/12)$$

$$i_{6,6} = [(1+0.065/1.025) - 1] \cdot 12/6$$

6 Months forward 6 month rate is 7.80% p.a.

The Bank is quoting 6/12 USD FRA at 6.50 – 6.75%

Therefore, there is an arbitrage Opportunity of earning interest @ 7.80% p.a. & Paying @ 6.75%

Borrow for 6 months, buy an FRA & invest for 12 months

To get \$ 1.065 at the end of 12 months for \$ 1 invested today
1.060# at the end of 12 months for every \$ 1 Borrowed

To pay \$ today

Net gain \$ 0.005 i.e. risk less profit for every \$ borrowed

$$\# (1+0.05/2) (1+.0675/2) = (1.05959) \text{ say } 1.060$$

b.

Sharpe Ratio $S = (R_p - R_f)/\sigma_p$

Treynor Ratio $T = (R_p - R_f)/\beta_p$

Where,

R_p = Return on Fund

R_f = Risk-free rate

σ_p = Standard deviation of Fund

β_p = Beta of Fund

Reward to Variability (Sharpe Ratio)

(4 marks)

Mutual Fund	R_p	R_f	$R_p - R_f$	σ_p	Reward to Variability	Ranking
A	15	6	9	7	1.285	2
B	18	6	12	10	1.20	3
C	14	6	8	5	1.60	1
D	12	6	6	6	1.00	5
E	16	6	10	9	1.11	4

Reward to Volatility (Treynor Ratio)
(4 marks)

Mutual Fund	R_p	R_f	$R_p - R_f$	β_p	Reward to Volatility	Ranking
A	15	6	9	1.25	7.2	2
B	18	6	12	0.75	16	1
C	14	6	8	1.40	5.71	5
D	12	6	6	0.98	6.12	4
E	16	6	10	1.50	6.67	3

Question 6

(a) Working Notes (2 marks)

(a)

	XYZ Ltd.	ABC Ltd.
Equity shares outstanding (Nos.)	10,00,000	4,00,000
EPS	₹ 40	₹ 28
Profit	₹ 400,00,000	₹ 112,00,000
PE Ratio	6.25	5.71
Market price per share	₹ 250	₹ 160

(b) EPS after merger

No. of shares to be issued (4,00,000 x 0.70)	2,80,000
Existing Equity shares outstanding	10,00,000
Equity shares outstanding after merger	12,80,000
Total Profit (₹ 400,00,000 + ₹ 112,00,000)	₹ 512,00,000
EPS	₹ 40

(i) Impact of merger on EPS of both the companies
(2marks)

	XYZ Ltd.	ABC Ltd.
EPS after Merger	₹ 40	₹ 28
EPS before Merger	₹ 40	₹ 28*
	Nil	Nil

* ₹ 40 x 0.70

(ii) Gain from the Merger if exchange ratio is 1: 1 (2 marks)

No. of shares to be issued	4,00,000
Exiting Equity shares outstanding	10,00,000
Equity shares outstanding after merger	14,00,000
Total Profit (` 400,00,000 + ` 112,00,000)	` 512,00,000
EPS	` 36.57
Market Price of Share (` 36.57 x 6.25)	` 228.56
Market Price of Share before Merger	` 160.00
Impact (Increase/ Gain)	` 68.56

(iii) Gain/ loss from the Merger to the shareholders of XYZ Ltd. (2 marks)

Market Price of Share	` 228.56
Market Price of Share before Merger	` 250.00
Loss from the merger (per share)	` 21.44

(iv) Maximum Exchange Ratio acceptable to XYZ Ltd. Shareholders (2 marks)

	` Lakhs
Market Value of Merged Entity (` 228.57 x 1400000)	3199.98
Less: Value acceptable to shareholders of XYZ Ltd.	2500.00
Value of merged entity available to shareholders of ABC Ltd.	699.98
Market Price Per Share	250
No. of shares to be issued to the shareholders of ABC Ltd. (lakhs)	2.80

Thus maximum ratio of issue shall be 2.80 : 4.00 or 0.70 share of XYZ Ltd. for one share of ABC Ltd.

(b) The formula for the Dividend valuation Model is

$$P = \frac{D_1}{Ke - g}$$

$$0$$

Ke = Cost of Capital

g = Growth rate

D_1 = Dividend at the end of year 1

On the basis of the information given, the following projection can be made:
(3 marks)

	EPS (₹)	DPS (₹)	PVF @15%	PV of DPS (₹)
2015	12.00 (9.60 x 125%)	4.80 (3.84 x 125%)	0.870	4.176
2016	15.00 (12.00 x 125%)	6.00 (4.80 x 125%)	0.756	4.536
2017	16.50 (15.00 x 110%)	8.25* (50% of ₹16.50)	0.658	5.429
				14.141

*Payout Ratio changed to 50%.

After 2017, the perpetuity value assuming 10% constant annual growth is:

$$D_1 = ₹ 8.25 \times 110\% = ₹ 9.075$$

Therefore P_0 from the end of 2017

$$\frac{₹ 9.075}{0.15 - 0.10} = ₹ 181.50$$

This must be discounted back to the present value, using the 3 year discount factor after 15%.

Present Value of P_0 (₹ 181.50 × 0.658)	119.43
Add: PV of Dividends 2015 to 2017	<u>14.14</u>
Expected Market Price of Share	<u>133.57</u>

(3 marks)

Question 7 (Attempt any four out of five)

a.

Synergy May be defined as follows: $V(AB) > V$

$(A) + V(B)$

In other words the combined value of two firms or companies shall be more than their individual value. Synergy is the increase in performance of the combined firm over what the two firms are already expected or required to accomplish as independent firms. This may be result of complimentary services economics of scale or both. **(1 mark)**

A good example of complimentary activities can be that one company may have a good networking of branches and the other company may have efficient production system. Thus the merged companies will be more efficient than individual companies. **(1 mark)**

On similar lines, economics of large scale is also one of the reasons for synergy benefits. The main reason is that, the large scale production results in lower average cost of production e.g. reduction in overhead costs on account of sharing of central services such as accounting and finances, office executives, top level management, legal, sales promotion and advertisement etc. **(1 mark)**

These economics can be “real” arising out of reduction in factor input per unit of output, or pecuniary economics are realized from paying lower prices for factor inputs for bulk transactions. **(1 mark)**

- b. To be financially sustainable, an organization must:
- have more than one source of income;
 - have more than one way of generating income;
 - do strategic, action and financial planning regularly;
 - have adequate financial systems;
 - have a good public image;
 - be clear about its values (value clarity); and
 - have financial autonomy.

(4marks)

- c. Cross-border leasing is a leasing agreement where lessor and lessee are situated in different countries. This raises significant additional issues relating to tax avoidance and tax shelters. It has been widely used in some European countries, to arbitrage the difference in the tax laws of different countries. **(1 mark)**

Cross-border leasing have been in practice as a means of financing infrastructure development in emerging nations. Cross-border leasing may have significant applications in financing infrastructure development in emerging nations - such as rail and air transport equipment, telephone and telecommunications, equipment, and assets incorporated into power generation and distribution systems and other projects that have predictable revenue streams. **(1 mark)**

A major advantage of cross-border leasing is to reduce the overall cost of financing through utilization by the lessor of tax depreciation allowances to reduce its taxable income. The tax savings are passed through to the lessee as a lower cost of finance. The basic prerequisites are relatively high tax rates in the lessor's country, liberal depreciation rules and either very flexible or very formalistic rules governing tax ownership. **(1 mark)**

Other important advantages of cross border leasing include the following:

- (i) The lessor is often able to utilize nonrecourse debt to finance a substantial portion of the equipment cost. The debt is secured by among other things, a mortgage on the equipment and by an assignment of the right to receive payments under the lease.
- (ii) Also, depending on the structure, in some countries the lessor can utilize very favourable “leveraged lease” financial accounting treatment for the overall transaction.
- (iii) In some countries, it is easier for a lessor to repossess the leased equipment following a lessee default because the lessor is an owner and not a mere secured lender.
- (iv) Leasing provides the lessee with 100% financing. **(1 mark)**

- d. Exchange Traded Funds (ETFs) were introduced in US in 1993 and came to India around 2002. ETF is a hybrid product that combines the features of an index mutual fund and stock and hence, is also called index shares. These funds are listed on the stock exchanges and their prices are linked to the underlying index. The authorized participants act as market makers for ETFs. **(1 mark)**

ETF can be bought and sold like any other stock on stock exchange. In other words, they can be bought or sold any time during the market hours at prices that are expected to be closer to the NAV at the end of the day. NAV of an ETF is the value of the underlying component of the benchmark index held by the ETF plus all accrued dividends less accrued management fees. **(1 mark)**

There is no paper work involved for investing in an ETF. These can be bought like any other stock by just placing an order with a broker.

Some other important advantages of ETF are as follows: **(2 marks)**

- a. It gives an investor the benefit of investing in a commodity without physically purchasing the commodity like gold, silver, sugar etc.
 - b. It is launched by an asset management company or other entity.
 - c. The investor does not need to physically store the commodity or bear the costs of upkeep which is part of the administrative costs of the fund.
 - d. An ETF combines the valuation feature of a mutual fund or unit investment trust, which can be bought or sold at the end of each trading day for its net asset value, with the tradability feature of a closed ended fund, which trades throughout the trading day at prices that may be more or less than its net asset value.
- e. The following attributes are considered crucial for qualifying for the derivatives trade: **(2 marks)**
- a. a commodity should be durable and it should be possible to store it;
 - b. units must be homogeneous;
 - c. the commodity must be subject to frequent price fluctuations with wide amplitude; supply and demand must be large;
 - d. supply must flow naturally to market and there must be breakdowns in an existing pattern of forward contracting.

The first attribute, durability and storability, has received considerable attention in commodity finance, since one of the economic functions often attributed to commodity derivatives markets is the temporal allocation of stocks. **(1/2 mark)**

Since commodity derivatives contracts are standardized contracts, the second attribute, requires the underlying product to be homogeneous, so that the underlying commodity as

defined in the commodity derivatives contract corresponds with the commodity traded in the cash market. This allows for actual delivery in the commodity derivatives market. **(1/2 mark)**

The third attribute, a fluctuating price, is of great importance, since firms will feel little incentive to insure themselves against price risk if price changes are small. A broad cash market is important because a large supply of the commodity will make it difficult to establish dominance in the market place and a broad cash market will tend to provide for a continuous and orderly meeting of supply and demand forces. **(1/2 mark)**

The last crucial attribute, breakdowns in an existing pattern of forward trading, indicates that cash market risk will have to be present for a commodity derivatives market to come into existence. Should all parties decide to eliminate each and every price fluctuation by using cash forward contracts for example, a commodity derivatives market would be of little interest. **(1/2 mark)**
