

## FINAL EXAMINATION

December 2017

**P-14(SFM)**  
**Syllabus 2016**

### Strategic Financial Management

Time Allowed: 3 Hours

Full Marks: 100

*The figures in the margin on the right side indicate full marks.*

*Working Notes should form part of your answers.*

*Wherever necessary, candidates may make appropriate assumptions and clearly state them.*

*No present value factor table or other statistical table will be given in addition to this question paper.*

*Candidates may use the values tabulated at the end of this question paper.*

*This paper contains two sections, A and B. Section A is compulsory and contains question 1 for 20 marks. Section B contains questions 2 to 8, each carrying 16 marks.*

*Answer **any five** questions from Section B.*

#### SECTION – A

*Answer all the questions. Each question carries two marks.*

1. Choose the correct option from the four alternatives given : (1 mark is for the correct choice and 1 mark is for the justification/workings. You may present only the Roman numeral, your choice and the reason/working, without copying the question.). 2×10=20

(i) A project has a 10% discounted pay back of 2 years with annual after tax cash inflows commencing from year end 2 to 4 of ₹ 400 lacs. How much would have been the initial cash outlay which was fully made at the beginning of year 1?

- (A) ₹ 400 lacs
- (B) ₹ 452 lacs
- (C) ₹ 633.80 lacs
- (D) ₹ 497.20 lacs

(Use p.v. factors only up to 3 decimal places.)

**Please Turn Over**



(ii) A project is expected to yield an after tax cash inflow at the end of year 2 of ₹ 150 lacs and has a cost of capital of 10%. Inflation is expected at 3% p.a. While computing the NPV of the project, this cash flow will be taken as the following:

(A)  $\frac{150}{\frac{1.03}{(1.1)^2}}$

(B)  $\frac{150}{\frac{(1.03)^2}{(1.1)^2}}$

(C)  $\frac{150}{(111.33\%)^2}$

(D)  $\frac{150 (1.03)^2}{(1.11)^2}$

(iii) A firm has an asset  $\beta = 1.3$ , equity  $\beta = 1.5$ . Then, which of the following is true?

(A) The firm is unlevered.

(B) Debt  $\beta$  is also 1.3.

(C) The above data is not possible.

(D) The firm is leveraged and the debt  $\beta$  is lower than the asset  $\beta$ .

(iv) For a portfolio containing three securities A, B and C,

correlation coefficients  $\rho_{AB} = +0.4$ ;  $\rho_{AC} = +0.75$ ;  $\rho_{BC} = -0.4$ ;

standard deviation  $\sigma_A = 9$ ;  $\sigma_B = 11$ ;  $\sigma_C = 6$ ;

weights  $\omega_A = 0.2$ ;  $\omega_B = 0.5$ ;  $\omega_C = 0.3$ ;

the covariance of securities A and B is

(A) 3.96

(B) 24.75

(C) 39.6

(D) 247.5

(v) A ₹ 1,000 per value bond bearing a coupon rate of 14% matures after 5 years. The required rate of return on this bond is 10%. The value of the bond (to the nearest rupee) will be:

(A) 1,125

(B) 1,152

(C) 1,512

(D) 862.20



(vi) The following information is available for a mutual fund:

Return 13%

Risk (S.D. i.e.  $\sigma$ ) 16%

Beta ( $\beta$ ) 0.90

Risk Free Rate 10%

Treynor's Ratio of the mutual fund is:

(A) 3.85

(B) 4.43

(C) 3.33

(D) 3.73

(vii) The 90 day interest rate is 1.85% in USA and 1.35% in the UK and the current spot exchange rate is \$ 1.6/£. The 90-day forward rate is

(A) \$ 1.607893

(B) \$ 1.901221

(C) \$ 1.342132

(D) \$ 1.652312

(viii) The intercept of the Security Market Line (SML) on the y axis is

(A)  $E(R_m) - R_f$

(B)  $1/[E(R_m) - R_f]$

(C)  $R_f - E(R_m)$

(D)  $R_f$

(ix) A mutual fund wants to hedge its portfolio of shares worth ₹ 10 crore using the NIFTY Index Futures. The contract size is 100 times the index. The index is currently quoted at 6840. The Beta of the portfolio is 0.8. The beta of the index may be taken as 1. What is the number of contracts to be traded?

(A) 110

(B) 116

(C) 145

(D) 123

(x) A call option at a strike price of ₹ 200 is selling at a premium of ₹ 24. At what share price on maturity will it break-even for the buyer of the option?

(A) ₹ 200

(B) ₹ 176

(C) ₹ 224

(D) ₹ 248

**SECTION – B**

Answer *any five* questions from question nos. 2 to 8. *Each question carries 16 marks.*

2. (a) The following are returns in % of securities A, B and the market in excess of the risk-free rate:

Security A	Security B	Market
12	16	14
15	18	16
18	20	18

(i) Determine the characteristic line for securities A and B.

(ii) What would be the beta of a portfolio consisting of 75% investment in A and 25% in B?

(iii) When the market return is 15%, what would be the return on the portfolio?

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(b) A firm has an investment proposal, requiring an outlay of ₹ 80,000. The investment proposal is expected to have two years economic life with no salvage value.



(5)

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In year 1, there is a 0.4 probability that cash inflow after tax will be ₹ 50,000 and 0.6 probability that cash inflow after tax will be ₹ 60,000. The probability assigned to cash inflow after tax for the year 2 are as follows:

Cash inflow year end 1 (₹)	50,000	60,000
Cash inflow year end 2 (₹)	Probability	Probability
	0.2    24,000	0.4    40,000
	0.3    32,000	0.5    50,000
	0.5    44,000	0.1    60,000

The firm uses 8% discount rate for this type of investment.

Construct a DECISION TREE for the proposed investment project and calculate the expected Net Present Value (NPV).

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3. (a) The following information is given in respect of two projects X and Y:

	X		Y	
Initial outlay at the beginning of the first year	6000		5000	
After Tax year end cash inflows with probabilities:	Cash inflow	Probability	Cash inflow	Probability
Year 1	2000	0.4	800	0.2
	3000	0.6	2000	0.8
Year 2	4000	0.3	2000	0.4
	2000	0.7	1000	0.6
Year 3	3000	0.5	2025	0.2
	2200	0.5	4000	0.8

The risk free discount rate is 10% and the risk adjusted discount rate is 14-13%.

Assume that cash flows are independent from year to year.

It is given that the annual standard deviation of cash inflows for X are 490, 916.5 and 400 and for Y are 480, 490 and 790.

- Find the NPVs for both the projects and based on this, which would you choose?
- Which project would you prefer in terms of risk? Why?

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**Please Turn Over**



- (b) The NAV of a mutual fund having 4,00,000 units are ₹ 9.25 and 9.95 per unit at the beginning and end of the year respectively. If the fund has to pay a dividend of ₹ 0.85 per unit and ₹ 0.70 as capital gain per unit what would be the annual returns expressed as a percentage?

If instead of paying dividend and capital gain, the scheme decided to reinvest the distributable amounts at an average NAV of ₹ 9.15 per unit, compute the revised returns and show how the balance sheet would appear after the reinvestment. 8

4. (a) Lee Industries wishes to install a plant in its factory at a cost of ₹ 100 lacs. It can lease the plant from LOR Co. for 3 year end payments of 34 lacs. LOR will maintain the plant at ₹ 5 lacs per annum payable at the end of each year with no charge to Lee for maintenance. Alternatively, Lee could borrow ₹ 100 lacs from the bank, either take an upfront extended warranty for 3 years for an additional 10 lacs, or incur 5 lacs maintenance charges like LOR without this extended warranty. Bank loan would involve an initial payment of ₹ 1 lac and three year end equated payments of principal together with 14% interest. The plant will qualify for annual depreciation of 31 lacs and 7 lacs is the expected salvage value. Both LOR and Lee have an after tax weighted average cost of capital of 10% and a tax rate of 50%.

Find out if the extended warranty is worthwhile.

Compute the Net Advantage to Leasing for Lee under the better option chosen for maintenance. Assume that extended warranty costs qualify for tax deduction at the end of year 1.

While evaluating this proposal for LOR, which discount rate would you use to determine the present value of the cash flows? Why?

(Show calculations in ₹ lacs up to 2 decimal places and use p.v. factors up to 3 decimal places. Present your cash flows for each year.) 8

- (b) An Oil Company needs 1000 barrels of crude oil after six months. The current price per barrel of crude oil is ₹ 3,300. It is expected that after 6 months, the price per barrel of crude oil is likely to touch ₹ 3,700. The company wants to hedge against the rising price for its requirement after 6 months. The 6 months futures contract price is now traded ₹ 3,500 per barrel. The size of a futures contract is 100 barrels.



(i) If the cost of capital, insurance and storage is 15% p.a., examine whether it is beneficial for the oil company to buy now.

(ii) If the upper limit to buying price is ₹ 3,500, what strategy can the firm adopt?

(iii) If the company decided to hedge through futures, find out the effective price it would pay for crude oil if at the time of lifting the hedge the spot and future prices are:  
Spot price- ₹ 3,420; Futures ₹ 3,600.

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5. (a) A manufacturing company has an old machine having no book value which can be sold now for ₹ 1,00,000. It can be used for another five years after which it will have to be condemned without any sale value. The company is examining the following options:

**Option I:** To upgrade the existing machine at a cost of ₹ 20 lacs and continue operations for a further 5 years at the end of which the ₹ 20 lacs would have also fully been depreciated equally over the next 5 years and will fetch a sale value of ₹ 50,000 at the end of the 5th year.

**Option II:** To replace the old machine with a new one costing ₹ 40 lacs which will have a useful life of 5 years, during which it will be fully depreciated equally. At the end of the 5th year, this machine will have a resale value of ₹ 10 lacs.

The following figures are the after-tax cash profits in rupees without the depreciation shield and the salvage values for the existing situation and the fresh options:

End of year	Existing Machine	Upgraded Machine	New Machine
1	10,00,000	11,00,000	12,00,000
2	10,80,000	11,80,000	12,80,000
3	11,20,000	12,20,000	13,80,000
4	12,00,000	13,00,000	14,80,000
5	13,00,000	14,00,000	16,00,000

The hurdle rate used for evaluation is 15%.

Consider that the salvage values and profits will be subjected to tax at the normal tax rate of 40%.

Present an incremental analysis of options I and II and state which is better.

Evaluate the better option above over continuing with the old machine without upgrading.

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(b) The following information is given:

Current Stock Price	₹ 190
Strike Price	₹ 210
Price of 6 months' European Put Option	₹ 10
Risk free interest rate p.a.	5%

(i) Calculate the theoretical minimum price of the put option at the end of 6 months.

Show the arbitrage process step by step and find out the gain if

(ii) the price on the expiration day is ₹ 200

(iii) the price on the expiration day is 220.

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6. (a) Companies M and N have the following interest rates:

	M	N
U.S. Dollars (floating rate)	LIBOR + 0.5%	LIBOR + 1%
Canadian Dollars Fixed Rate	6%	4.5%

M wants to borrow Canadian Dollars at fixed rate while N wants US dollars at floating rate.

F, a financial institution charges, if it arranges a swap, 50 basis points spread.

Design, if possible, a swap to share the benefits equally between M and N. Discuss the steps of action in the swap and arrive at the final effective interest rate for M and N.

In case a swap is not possible, give your calculations to substantiate why it is not possible.

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(b) From the following information, find out the market price of risk of portfolio.

Market Return	Standard Deviation of Market Return	Return on Government Bonds	Standard Deviation of Portfolio
20%	7%	7%	9%
22%	8%	8%	5%
24%	10%	9%	13%

Also determine the expected return for each of the above cases.

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7. (a) The following information is given:

Spot rate for 1 US Dollar	₹ 64.0123
180 days' forward rate for 1 USD	₹ 64.9120
Annualised interest rate for 6 months–Rupee	12%
Annualised interest rate for 6 months – US Dollar	8%

Does any arbitrage opportunity exist? Discuss the sequence of activities for gain using 1000 units of currency and compute the gains, if any. 8

- (b) An investor has a sum of ₹ 40 lacs with which he wishes to construct a portfolio of securities X and Y. The following information is provided:

Security	Expected Return (%)	Standard Deviation (%)
X	18	12
Y	20	15

The coefficient of correlation between the returns of X and Y is 0.7.

- (i) How much should he invest in X and Y in order to have a portfolio of minimum variance? What would be this minimum variance?
- (ii) If he invested equally in X and Y, what would be the variance of the portfolio?
- (iii) Would you consider his portfolio in (i) and (ii) sufficiently diversified? Why? 8

8. Answer **any four** out of the following 5 questions:

- (a) Fill in the following table – Identify the function of the bank under the appropriate classification and tick to mention whether it is a banking or a non-banking function: (You are required to write only columns I, III, IV and V in your answer.)

I	II	III	IV	V
Sl. No	Activity	Category of Function	Banking Function	Non-Banking Function
(i)	Discounting bills of exchange			
(ii)	Electronic Funds Transfer between accounts of customers			
(iii)	Periodic payments of electricity bills of customers			
(iv)	Acceptance of Public Provident Fund Deposits			

- (b) Discuss the nature of call money market in India with reference to the duration, borrowers and security. 4
- (c) Differentiate between yield based auction and price based auction in the securities market regarding acceptance and cut off points. 4
- (d) Identify the type of risk in each of the following (Present only the Roman numeral and state the risk in your answers without copying the statements given below.):
- (i) Frauds committed by employees.
  - (ii) The fear of the seller of a fall in prices and of the buyer, of rise in prices.
  - (iii) Risk of loss arising from the inability of a debtor to pay his loan obligation.
  - (iv) Risk that a borrower of a housing loan prepays his loan much ahead of his scheduled duration. 4
- (e) State any four features of Foreign Currency Convertible Bonds (FCCB). 4

Candidates may choose appropriate values from the following tables for use in various answers.

PV factor  $\frac{1}{(1+x)^n}$ , where  $x$  is the interest rate,  $n$  is the number of years.

$n \rightarrow$	1	2	3	4	5	6	7	8	9	10
Rate $\downarrow$										
6%	0.943	0.890	0.837	0.792	0.747	0.705	0.665	0.627	0.592	0.558
7%	0.935	0.873	0.816	0.763	0.713	0.666	0.623	0.582	0.544	0.508
8%	0.926	0.857	0.794	0.735	0.681	0.630	0.583	0.540	0.500	0.463
10%	0.909	0.826	0.751	0.683	0.621	0.564	0.513	0.467	0.424	0.386
14%	0.877	0.769	0.675	0.592	0.519	0.456	0.400	0.351	0.308	0.270
14.13%	0.876	0.768	0.673	0.589	0.516	0.452	0.396	0.347	0.304	0.267
14.3%	0.875	0.765	0.670	0.586	0.513	0.448	0.392	0.343	0.300	0.263
15%	0.870	0.756	0.658	0.572	0.497	0.432	0.376	0.327	0.284	0.247



$e^{0.005}$	1.005
$e^{0.05}$	1.0513
$e^{0.025}$	1.0253
$e^{0.25}$	1.2840
$e^{0.15}$	1.1618
$e^{0.6}$	1.8221
$e^{1.5}$	4.4817
$e^{0.075}$	1.0779
$e^{0.0375}$	1.0382
$e^{0.75}$	2.1170
$e^{0.9}$	2.4596
$e^{0.075}$	1.0779

$e^{-0.005}$	0.9950
$e^{-0.05}$	0.9512
$e^{-0.025}$	0.9753
$e^{-0.25}$	0.7788
$e^{-0.15}$	0.8607
$e^{-0.6}$	0.5481
$e^{-1.5}$	0.2231
$e^{-0.075}$	0.9277
$e^{-0.0375}$	0.9632
$e^{-0.75}$	0.4724
$e^{-0.9}$	0.4066