

Answer to MTP_Final_Syllabus 2008_Jun2015_Set 1

Paper-12: FINANCIAL MANAGEMENT & INTERNATIONAL FINANCE

Time Allowed: 3 Hours

Full Marks: 100

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

Answer Question No. 1 from Part A which is compulsory and any five questions from Part B.

PART A (25 Marks)

1. (a) In each, of the cases given below, one out of four answers is correct. Indicate the correct answer (= 1 mark) and give workings/reasons briefly in support of your answer (= 1 mark) [2x9=18]
- (i) What is the opportunity cost of not taking a discount, when the credit terms are 2/20 net 45? Assume 1 year = 360 days
- A. 24.9%
 - B. 29.4%
 - C. 22.9%
 - D. 29.2%
- (ii) E Limited has earnings before interest and taxes (EBIT) of ₹ 10 million at a cost of 7%., Cost of equity is 12.5%. Ignore taxes. Calculate the overall cost of capital.
- A. 11.26%
 - B. 11.62%
 - C. 16.12%
 - D. 12.61%
- (iii) S Limited earns ₹ 6 per share, has capitalisation rate of 10% and has a return on investment at the rate of 20%. According to Walter's model, calculate the price per share at 30% dividend payout ratio.
- A. ₹120
 - B. ₹102
 - C. ₹112
 - D. ₹106
- (iv) On January 1, 2014, X Limited's beginning inventory was ₹4,00,000. During 2014, X Ltd. purchased ₹19,00,000 of additional inventory. On December 31, 2014, X Ltd.'s ending inventory was ₹5,00,000. Calculate the X Ltd.'s operating cycle in 2014, if it is assumed that the average collection period is 42 days. (1 year =365 days).
- A. 123.3 days
 - B. 132.3 days
 - C. 126.3 days
 - D. 133.3 days

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- (v) From the following, what is the amount of sales of A Ltd.? Financial Leverage — 3:1; Interest—₹200; Operating Leverage — 4 : 1; Variable Cost as a % of sales — 66.67%.
- A. ₹3,600
 - B. ₹6,300
 - C. ₹6,030
 - D. ₹3,060
- (vi) The dollar is currently trading at ₹40. If rupee depreciates by 10%, what will be the spot rate?
- A. ₹0.0525
 - B. ₹0.0552
 - C. ₹0.0225
 - D. ₹0.0522
- (vii) If the following rates are prevailing: Euro/\$: 1.1916/1.1925 and \$/£ : 1.42/1.47 what will be the cross rate between Euro/Pound?
- A. 1.6921/1.750
 - B. 1.7530/1.6921
 - C. 1.6921/1.1925
 - D. 1.7530/1.1916
- (viii) A company has expected Net Operating Income – ₹ 2,40,000; 10% Debt – ₹7,20,000 and Equity Capitalisation rate - 20% what is the weighted average cost of capital for the company?
- A. 0.15385
 - B. 0.13585
 - C. 0.18351
 - D. 0.15531
- (ix) The P/V ratio of a firm dealing in precision instruments is 50% and margin of safety is 40%. Calculate net profit, if the sales volume is ₹ 50,00,000.
- A. ₹ 1,00,000
 - B. ₹ 5,00,000
 - C. ₹ 10,00,000
 - D. ₹ 6,00,000

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(b) State if each of the following sentences is T (= true) or F (= false): [1×7=7]

- (i) Deterministic model of financial planning yield multiple — point estimate.
- (ii) Risk under transaction exposure can be minimized using Money Market Hedge.
- (iii) Flexibility is one among the performance indicators of the organisation.
- (iv) A project is a "One-shot" major undertaking.
- (v) Fund Managers use futures as a more economical way of achieving their portfolio goals.
- (vi) The profit or loss associated with converting foreign currency dominated assets/liabilities in reporting currency is called Economic Exposure.
- (vii) TRIMs are the rules; a country applies to the domestic regulations to promote Foreign investment, often as a part of an Industrial Policy.

Answer:

1. (a)

(i) (B) 29.4%

$$\begin{aligned}\text{Opportunity cost} &= \frac{\text{discount percent}}{100 - \text{discount percent}} \times \frac{360}{N} \\ &= \frac{2}{98} \times \frac{360}{25} \\ &= 29.4\%\end{aligned}$$

(ii) (A) 11.26%

$$\begin{aligned}\text{Market Value of equity (S)} &= \frac{\text{EBIT} - I}{k_e} = \frac{\text{₹}10,000,000 - 1,400,000}{0.125} \\ &= \text{₹}68,800,000\end{aligned}$$

$$\begin{aligned}\text{Total value of Firm (V)} &= S + D = \text{₹}68,800,000 + \text{₹}20,000,000 \\ &= \text{₹}88,800,000\end{aligned}$$

$$\begin{aligned}\therefore \text{Overall cost of capital (K}_0\text{)} &= \frac{\text{EBIT} - I}{V} \\ &= \frac{\text{₹}10,000,000}{\text{₹}88,800,000} \\ &= 11.26\%\end{aligned}$$

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(iii) (B) ₹102

$$\begin{aligned}\text{Market Value of share (P)} &= \frac{D + \frac{r}{K_e}(E-D)}{K_e} \\ &= \frac{1.80 + \frac{0.20}{0.10}(6-1.80)}{0.10} \\ &= ₹102\end{aligned}$$

(iv) (D) 133.3 days

$$\begin{aligned}\text{Cost of goods sold} &= ₹(4,00,000 + 1,900,000 - 500,000) \\ &= ₹1,800,000\end{aligned}$$

$$\text{Inventory turnover} = \frac{₹1,800,000}{₹450,000} = 4$$

$$\text{Average age of Inventory} = \frac{365}{4} = 91.3 \text{ days}$$

$$\begin{aligned}\therefore \text{Operating cycle} &= \text{Average age inventory} + \text{Average Collection Period} \\ &= 91.3 + 42 = 133.3 \text{ days}\end{aligned}$$

(v) (A) ₹3,600

$$\text{Financial Leverage} = \frac{\text{EBIT}}{\text{EBT}} = \frac{3}{1}$$

$$\text{EBIT} = 3\text{EBT}$$

$$\text{EBIT} - 200 = \text{EBT}$$

$$\text{EBIT} = 3[\text{EBIT} - 200] \quad \therefore \text{EBIT} = ₹300$$

$$\text{Operating Leverage} = \frac{S-V}{\text{EBIT}} = \frac{4}{1}$$

$$S - V = 4 \text{ EBIT} = 4 \times 300 = 1200$$

$$(100 - 66.67\%)S = 1200$$

$$\therefore \text{Sales} = \frac{1200}{33\frac{1}{3}} = ₹3600$$

(vi) (C) ₹0.0225

$$\text{Re quote : Re.1} = \$1/40 = 0.25$$

$$\begin{aligned}\text{If rupee depreciates by 10\%, then} &= 0.25 - 0.0025 \\ &= ₹0.0225\end{aligned}$$

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(vii) (A) 1.6921/1.7530

$$\text{Bid (Euro/£)} = \text{Bid (Euro/\$)} \times \text{Bid (\$/£)}$$

$$\text{Bid rate for } \text{€} / \text{£} = 1.1916 \times 1.42 = 1.6921$$

$$\text{Ask rate for } \text{€} / \text{£} = 1.1925 \times 1.47 = 1.7530$$

$$\therefore \text{Quote as } \text{€} / \text{£} = 1.6921 / 1.7530$$

(viii) (A) 0.15385

$$\text{Market value of equity (S)} = \frac{2,40,000 - 720,000(0.2)}{0.20} = 840,000$$

$$\text{Total value of firm (V)} = S + D = 840,000 + 720,000 = 1,560,000$$

$$K_0 = \frac{\text{NOI}}{V} = \frac{240,000}{1,560,000} = 0.15385$$

(ix) (C) ₹10,00,000

Margin of Safety	= 50,00,000@40%	= ₹20,00,000
BEP Sales	= 50,00,000 – 20,00,000	= ₹30,00,000
Fixed cost	= BEP (s) × p/v ratio	= 30,00,000@50% = 15,00,000
Contribution	= 50,00,000 × 50/100	= ₹25,00,000
Profit	= 25,00,000 – 15,00,000	= ₹10,00,000

(b)

(i) False

(ii) True

(iii) True.

(iv) True

(v) True

(vi) False

(vii) True

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Part B (75 Marks)

2 (a). GMBH is in software development business. It has recently been awarded a contract from an Asian country for computerisation of its all offices and branches spread across the country. This will necessitates acquisition of a super computer at a total cost of ₹10 crore. The expected life of computer is 5 years. The scrap value is estimated at ₹5 crore. However, this value could even be much lower depending upon the developments taking place in the field of computer technology.

A leasing company has offered a lease contract will total lease rent of ₹1.5 crore per annum for 5 years payable in advance with all maintenance costs being borne by lessee.

The other option available is to purchase the computer by taking loan from the bank with variable interest payment payable semi-annually in arrears at a margin of 1% per annum above MIBOR. The MIBOR forecast to be at a flat effective rate of 2.4% for each 6 month period, for the duration of loan.

Tax rate applicable to corporation is 30%. For taxation purpose depreciation on computer is allowed at 20% as per WDV method, with a delay of 1 year between the tax depreciation allowance arising and deduction from tax paid & capital gain tax arising on sale of computer. You are required to calculate:

- I. Compound annualised post tax Cost of Debt.
- II. NPV of lease payment v/s purchase decisions at discount rate of 5% & 6%.
- III. The break even post tax Cost of debt at which corporation will be indifferent between leasing and purchasing the computer.
- IV. Which option should be opted for? [1+(3+4)+1+1]

Answer to 2 (a):

- I. First we shall compute annual interest rate as follows:

$$\text{Annual Interest Rate} = (1.024)^2 - 1 = 4.9\%$$

$$\text{Thus, Pre Tax Interest and Post Tax Interest Rate} = 4.9\% + 1\% = 5.9\%$$

$$= 5.9\% (1 - 0.30) = 5.9\% \times 0.70 = 4.13\%$$

- II. Working Notes:

Calculation of Tax Savings on Depreciation

(₹)

Year	Opening value	Depreciation	Closing value	Tax saving @ 30%
1	10,00,00,000	2,00,00,000	8,00,00,000	60,00,000
2	8,00,00,000	1,60,00,000	6,40,00,000	48,00,000
3	6,40,00,000	1,28,00,000	5,12,00,000	38,40,000
4	5,12,00,000	1,02,40,000	4,09,60,000	30,72,000
5	4,09,60,000	81,92,000	3,27,68,000	24,57,600

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Capital Gain tax = (₹5,00,00,000 - ₹3,27,68,000) × 30% = ₹51,69,600 Total

Tax Liability for Year 5 = ₹51,69,600 - ₹24,57,600 = ₹27,12,000

Statement showing NPV Lease Option

(₹)

Particulars	Period	Cash flow (₹)	5%		6%	
			PVF	PVCO	PVF	PVCO
Lease payment	0-4	1,50,00,000	4.546	6,81,90,000	4.465	6,69,76,584
(-) Tax savings	1-5	(45,00,000)	4.329	(1,94,80,500)	4.212	(1,89,54,000)
PVCO (A)				4,87,09,500		4,80,22,584

Statement showing NPV in Borrow & Buy decision

(₹)

	Period	Cash flows (₹)	5%		6%	
			PVF	PVCO	PVF	PVCO
	0	10,00,00,000	1.000	10,00,00,000	1.000	10,00,00,000
(-) Tax Savings	1	0	0.962	0	0.943	0
	2	(60,00,000)	0.907	(54,42,000)	0.890	(53,58,000)
	3	(48,00,000)	0.864	(41,47,200)	0.840	(40,32,000)
	4	(38,40,000)	0.823	(31,60,320)	0.792	(30,41,280)
	5	(30,72,000)	0.784	(240,84,48)	0.747	(22,94,784)
(+) Tax Liability	6	27,12,000	0.746	20,23,152	0.705	19,11,960
(-) Terminal Value	5	(5,00,00,000)	0.784	(3,92,00,000)	0.797	(3,73,50,000)
				4,76,65,184		4,98,35,896
				(10,44,316)		18,13,312

III.
$$5\% + \left[1\% \times \frac{₹10,44,316}{₹28,57,628} \right]$$

 = 5.37%

- IV. Since the Break Even post tax Cost of debt at which corporation will be indifferent between leasing and purchasing the computer (i.e. IRR of Lease Option) is 5.37%, which is higher than the actual post tax cost of borrowing of 4.13%. Hence, it is advised to the corporation to go for borrow and buy option instead of lease option.

2 (b). List the relevance of Social Cost Benefit Analysis for Private Enterprise.

[5]

Answer to 2(b):

Relevance of Social Cost Benefit Analysis for Private Enterprises

- I. Social cost benefit analysis is important for private corporations also which have a moral responsibility to undertake socially desirable projects.

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- II. If the private sector includes social cost benefit analysis in its project evaluation techniques, it will ensure that it is not ignoring its own long-term interest, since in the long run only projects that are socially beneficial and acceptable, will survive.
- III. Methodology of social cost benefit analysis can be adopted either from the guidelines issued by the United Nations Industrial Development Organisation (UNIDO) or the Organisation of Economic Cooperation and Development (OECD). Financial Institutions e.g. IDBI, IFCI, etc. even insist on social cost benefit analysis of a private sector project before sanctioning any loan.

Private enterprise cannot afford to lose sight of social aspects of a project.

3 (a). List out the steps involved to determine the financial viability of a project. [4]

Answer to 3(a):

The steps involved to determine the financial viability of a project are as follows:

- (i) Determination of project cost
- (ii) Sources of fund/means of financing and proper utilization of fund
- (iii) Profitability analysis
- (iv) Break-even analysis
- (v) Cash flow/fund flow statement
- (vi) Debt service coverage ratio.

3 (b). The following data is available for Bajaj Ltd.:

Sales	₹ 2,00,000
Less : Variable cost @30%	<u>60,000</u>
Contribution	1,40,000
Less : Fixed Cost	<u>1,00,000</u>
EBIT	40,000
Less : Interest	<u>5,000</u>
Profit before tax	<u>35,000</u>

Find out:

- (i) Using the concept of financial leverage, by what percentage will the taxable income increase if EBIT increase by 6%?
- (ii) Using the concept of operating leverage, by what percentage will EBIT increase if there is 10% increase in sales, and
- (iii) Using the concept of leverage, by what percentage will the taxable income increase if the sales increase by 6%? Also verify results in view of the above figures. [2×3=6]

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Answer to 3(b):

(i) Degree of financial leverage:

$$DFL = EBIT/Profit\ before\ Tax = 40,000/35,000 = 1.14$$

If EBIT increase by 6%, the taxable income will increase by $1.14 \times 6 = 6.85\%$ and it may be verified as follows :

EBIT (after 6% increase)	₹ 42,400
Less: Interest	<u>5,000</u>
Profit before Tax	<u>37,400</u>
Increase in taxable income is ₹ 2,400 i.e., 6.85% of ₹ 35,000	

(ii) Degree of operating leverage:

$$DOL = Contribution/EBIT = 1,40,000/40,000 = 3.50$$

If Sales increase by 10%, the EBIT will increase by $3.50 \times 10 = 35\%$ and it may be verified as follows :

Sales (after 10% increase)	₹ 2,20,000
Less: Variable Expenses @30%	<u>66,000</u>
Contribution	1,54,000
Less: Fixed cost	<u>1,00,000</u>
EBIT	<u>54,000</u>

Increase in EBIT is ₹ 14,000 i.e., 35% of ₹ 40,000.

(iii) Degree of combined leverage:

$$DCL = Contribution/Profit\ before\ Tax = 1,40,000/35,000 = 4$$

If Sales increases by 6%, the profit before tax will increase by $4 \times 6 = 24\%$ and it may be verified as follows :

Sales (after 6% increase)	₹ 2,12,000
Less : Variable Expenses @ 30%	<u>63,600</u>
Contribution	1,48,400
Less : Fixed cost	<u>1,00,000</u>
EBIT	48,400
Less : Interest	<u>5,000</u>
Profit before Tax	<u>43,400</u>

Increase in Profit before tax is ₹ 8,400 i.e., 24% of ₹ 35,000.

3 (c). The following figures are collected from the annual report of XYZ Ltd:

	₹
Net Profit	30 lakhs
Outstanding 12% preference shares	100 lakhs
No. of equity shares	3 lakhs
Return on Investment	20%
Cost of Equity	16%

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What should be the approximate dividend pay-out ratio so as to keep the share price at ₹ 48 by using Walter's model? [5]

Answer to 3(c):

	₹ in lakhs
Net Profit	30
Less: Preference dividend	12
Earning for equity shareholders	18
Therefore earning per share	18/3 = ₹ 6.00

Let, the dividend pay out ratio be x and so the share price will be:

$$P = \frac{D}{K_e} + \frac{r(E-D)}{K_e}$$

Here D = 6x; E = ₹ 6; r = 0.20 and Ke = 0.16 and P = ₹ 48

$$\text{Hence } ₹ 48 = \frac{6x}{0.16} + \frac{0.2(6-6x)}{0.16 \times 0.16}$$

$$\text{or, } ₹ 48 = 37.50x + 46.875(1-x)$$

$$\text{or, } 9.375x = 1.125$$

$$\text{or, } x = 0.12$$

So, the required dividend payout ratio will be = 12%

4 (a). The Directors of Grasswood Ltd. present you with the Balance sheets as on 30th June, 2013 and 2014 and ask you to prepare statements which will show them what has happened to the money which came into the business during the year 2014.

Liabilities :	30.6.13	30.6.14
Authorised capital 15,000 shares of ₹ 100 each	15,00,000	15,00,000
Paid up capital	10,00,000	14,00,000
Debentures (2014)	4,00,000	—
General Reserve	60,000	40,000
P & L Appropriation A/c	36,000	38,000
Provision for the purpose of final dividends	78,000	72,000
Sundry Trade Creditors	76,000	1,12,000
Bank Overdraft	69,260	1,29,780
Bills Payable	40,000	38,000
Loans on Mortgage	—	5,60,000
	17,59,260	23,89,780

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Assets :		
Land & Freehold Buildings	9,00,000	9,76,000
Machinery and Plant	1,44,000	5,94,000
Fixtures and Fittings	6,000	5,500
Cash in hand	1,560	1,280
Sundry Debtors	1,25,600	1,04,400
Bills Receivable	7,600	6,400
Stock	2,44,000	2,38,000
Prepayments	4,500	6,200
Share in other companies	80,000	2,34,000
Goodwill	2,40,000	2,20,000
Preliminary expenses	6,000	4,000
	17,59,260	23,89,780

You are given the following additional information:

- A. Depreciation has been charged (i) on Freehold Buildings @ 2½% p.a. on cost ₹ 10,00,000. (ii) on Machinery and plant ₹ 32,000 (iii) on Fixtures and Fittings @5% on cost, ₹ 10,000. No depreciation has been written off on newly acquired Building and Plant and Machinery.
- B. A piece of land costing ₹ 1,00,000 was sold in 2014 for ₹ 2,50,000. The sale proceeds were credited to Land and Buildings.
- C. Shares in other companies were purchased and dividends amounting to ₹ 6,000 declared out of profits made prior to purchase has received and use to write down the investment (shares).
- D. Goodwill has been written down against General Reserve.
- E. The proposed dividend for the year ended 30th June 2013 was paid and, in additions, an interim dividend, ₹ 52,000 were paid.

[10]

Answer to 4(a):

Funds Flow Statement

Sources		Applications	
Decrease in working capital	121500	Purchase of land and building	351000
Sale proceed of land	250000	Purchase of plant and machinery	482000
Dividend received	6000	Purchase of shares (investment)	160000
Issue of Shares	400000	Redemption of debentures	400000
Loan	560000	Dividends for 2013 paid	78000
Funds from operations	185500	Interim dividend paid	52000
	1523000		1523000

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Working note No.1: Changes in working capital

	2013	2014
Current assets		
Cash	1560	1280
Debtors	125600	104400
Bills receivable	7600	6400
Prepaid	4500	6200
Stock	<u>244000</u>	<u>238000</u>
Total Current Asset	<u>383260</u>	<u>356280</u>
Current liabilities		
Creditors	76000	112000
Overdraft	69260	129780
Bills payable	<u>40000</u>	<u>38000</u>
Total Current Liabilities	<u>185260</u>	<u>279780</u>
Working capital	198000	76500
Decrease in working capital		121500

Working note No.2:

Depreciation

On Buildings	25000
On Plant & Machinery	32000
On Furniture & Fittings	<u>500</u>
	<u>57500</u>

Working note No. 3: Purchase or sale of fixed assets / Investments:

Land and buildings:

2013 (WDV)	900000
(-) Depreciation	<u>25000</u>
	875000
(-) Land sold	<u>100000</u>
	775000
(+) Purchases (b/f)	<u>351000</u>
	1126000
(-) Profit on sale	<u>150000</u>
2014 (WDV)	<u>976000</u>

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Plant & machinery:

WDV	144000
(-) Depreciation	<u>32000</u>
	112000
(+) Purchase (b/f)	<u>482000</u>
	<u>594000</u>

Investments:

2013	80000
(-) Dividend in capital nature	<u>6000</u>
	74000
(+) Purchases (b/f)	<u>160000</u>
2014	<u>234000</u>

Working note No.4:

P & L Adjustment A/c

To depreciation	57500	By balance b/d	36000
To dividend proposed	72000	By funds from operation(b/f)	185500
To preliminary expenses written off	2000		
	52000		
To interim dividend	38000		
	221500		221500

4 (b). Describe are the basic elements of joint venture?

[5]

Answer to 4 (b):

Contractual Agreement. JVs are established by express contracts that consist of one or more agreements involving two or more individuals or organizations and that are entered into for a specific business purpose.

Specific Limited Purpose and Duration. JVs are formed for a specific business objective and can have a limited life span or long-term. JVs are frequently established for a limited duration because (a) the complementary activities involve a limited amount of assets; (b) the complementary assets have only a limited service life; and/or (c) the complementary production activities will be of only limited efficacy.

Joint Property Interest. Each JV participant contributes property, cash, or other assets and organizational capital for the pursuit of a common and specific business purpose. Thus, a JV is not merely a contractual relationship, but rather the contributions are made to a newly-formed business enterprise, usually a corporation, limited liability company, or partnership. As such, the participants acquire a joint property interest in the assets and subject matter of the JV.

Common Financial and Intangible Goals and Objectives. The JV participants share a common expectation regarding the nature and amount of the expected financial and intangible goals and objectives of the JV. The goals and objectives of a JV tend to be narrowly focused, recognizing that the assets deployed by each participant represent only a portion of the overall resource base.

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Shared Profits, Losses, Management, and Control. The JV participants share in the specific and identifiable financial and intangible profits and losses, as well as in certain elements of the management and control of the JV.

5 (a). A company requires ₹ 20 lacs and provides the following information:

- Target Debt Equity Ratio = 3:2
- $K_d = 12\%$, for the first 4 lacs and 12.5% for the balance
- EPS for the current year ₹ 20 per share
- Dividend payout ratio 60%, growth rate 5%
- Current MPS ₹ 90. Flotation Cost ₹ 6 each
- Present Equity Share Capital ₹ 2 lacs, divided into fully paid shares of ₹ 10 each.
- Corporate Tax Rate 30%.

Calculate weighted Marginal Cost of Capital.

[8]

Answer to 5 (a):

Calculation of Marginal Cost of Capital:

Particulars	₹	Proportion	After tax cost	Marginal WACC $5 = (3 \times 4)$
Equity Share Capital (New)	6,40,000	6.4/20	20.00%	6.40%
Retained Earning	1,60,000	1.6/20	19.00%	1.52%
12% Debenture	4,00,000	4/20	8.40%	1.68%
12.5% Debenture	8,00,000	8/20	8.75%	3.50%
	20,00,000			$K_0 = 13.10\%$

Working Notes:

(i) Calculation of Retained Earnings:

$$\begin{aligned}
 \text{Retained Earnings} &= \text{Earning for Eq Share holder (EES)} - \text{Dividend} \\
 &= (\text{EPS} \times \text{No. of Share}) - (\text{DPS} \times \text{No. of Share}) \\
 &= ₹ 20 \times 20,000 - 20 \times 0.60 \times 20,000 \\
 &= ₹ 4,00,000 - 2,40,000 = ₹ 1,60,000
 \end{aligned}$$

(ii) External Debt:

$$\begin{aligned}
 ₹ 20,00,000 \times 3/5 &= ₹ 12,00,000 \\
 12\% \text{ Debt} &= ₹ 4,00,000 \\
 12.5\% \text{ Debt} &= ₹ 8,00,000 \text{ (i.e. } 12,00,000 - 4,00,000)
 \end{aligned}$$

(iii) External Equity Require:

$$\begin{aligned}
 &= (\text{Total Fund} \times \text{Proportion of Equity}) - \text{Retained Earnings} \\
 &= ₹ 20,00,000 \times 2/5 - 1,60,000 \\
 &= ₹ 8,00,000 - 1,60,000 \\
 &= ₹ 6,40,000
 \end{aligned}$$

Answer to MTP_Final_Syllabus 2008_Jun2015_Set 1

(iv) Cost of Equity (For New Shares):

$$K_e = \frac{D_1}{NP} + g$$

where $D_1 = D_0(1+g)$

$$= \frac{(20 \times 0.60)(1+0.05)}{90-6} + 0.05$$
$$= \frac{12 \times 1.05}{84} + 0.05 = 20\%$$

Where, D_1 = Expected dividend per share
 D_0 = Current dividend per share
 g = growth rate
NP = Net Proceeds

(v) Cost of 12% Debt:

$$= l(1-t)$$
$$= 12\%(1-0.30)$$
$$= 8.4\%$$

Where l = Interest
 t = tax rate

(vi) Cost of 12.5% Debt:

$$= l(1-t)$$
$$= 12.5\%(1-0.30)$$
$$= 8.75\%$$

(vii) Cost of Retained Earnings:

$$= \frac{D_1}{MP} + g = \frac{D_0(1+g)}{MP} + g$$
$$= \frac{(20 \times 0.60)(1+0.05)}{90} + 0.05$$
$$= \frac{12.6}{90} + 0.05$$
$$= 19\%$$

- 5 (b). Zenith Ltd. currently has an annual turnover of ₹ 20 lakhs and an average collection period of 4 weeks. The company propose to introduce a more liberal credit policy which they hope will generate additional sales, as shown below:

	Additional Collection Period	Sales	default
1	2 Weeks	2,00,000	2%
2	4 Weeks	2,50,000	3%
3	6 Weeks	3,50,000	5%
4	8 Weeks	5,00,000	8%

The selling price of the product is ₹ 10 and the variable cost per unit is ₹ 7.

Answer to MTP_Final_Syllabus 2008_Jun2015_Set 1

The current bad debt loss is 1 % and the desired rate of return on investment is 20%. For the purpose of calculation, a year is to be taken to comprise of 52 weeks. Indicate which of the above policies you would recommend the company to adopt. [7]

Answer to 5 (b):

Comparative statement of various credit policies

Particulars	Current	Policy 1	Policy 2	Policy 3	Policy 4
Sales ₹ Lac	20.0	22.0	22.5	23.5	25.0
Contribution @ 30%	6.0	6.6	6.8	7.1	7.5
Bad debts %	1%	2%	3%	5%	6%
Amount of bad debts ₹ Lac	0.2	0.4	0.7	1.2	1.5
Average collection period in weeks	4	6	8	10	12
Average debtors ₹ Lacs	1.5	2.5	3.5	4.5	5.8
Cost of debtors @ 20%	0.3	0.5	0.7	0.9	1.2
Contribution - bad debts - cost of debtors	5.5	5.7	5.4	5.0	4.8

The net benefit is highest with Policy 1 with credit period of 6 weeks. It is recommended for adoption.

6 (a). The following data relates to ABC Ltd.'s share prices:

Current price per share	₹ 180
Price per share in the 6m futures market:	₹ 195

It is possible to borrow money in the market for securities transactions at the rate of 12% per annum.

Required:

- I. Calculate the theoretical minimum price of a 6-month futures contract.
- II. Explain if any arbitrage opportunities exist. [2+5]

Answer to 6 (a):

- I. Theoretical Minimum Price of a 6-month forward contract:
 Future's Price = Spot + Cost of Carry – Dividend
 F = 180 + 180 × 0.12 × - 0
 = 190.80

Thus we see that Futures price by calculation is ₹ 190.80 and is quoting at ₹ 195 in the exchange.

Answer to MTP_Final_Syllabus 2008_Jun2015_Set 1

II. Analysis:

Fair Value of Futures LESS than Actual Futures Price;
Futures Overvalued. Hence SELL. Do Arbitrage by buying stock in Cash Market.

Step I

Buy ABC Ltd. stock at ₹ 180 by borrowing at 12% for 6 months. Therefore his outflows are

Cost of Stock	180.00
Add: Interest @ 12% for 6 months i.e. 0.5 year	$(180 \times 0.12 \times 0.5) = 10.80$
Total outflows (A)	190.80

Step II

He will sell 6-month futures at ₹ 195. Hence, his inflows are

Sales proceeds of futures	195.00
Add: Dividend received for his stock	0.00
Total outflows (B)	195.00

$$\begin{aligned}\text{Inflow} - \text{Outflow} &= \text{Profit earned by Arbitrageur} \\ &= 195 - 190.80 = ₹ 4.20 \text{ per share.}\end{aligned}$$

Note: We have ignored transaction costs like commission, margin, etc.

- 6 (b). Nifty Index is currently quoting at 1300. Each lot is 250. Mr. X purchases a March contract at 1300. He has been asked to pay 10% initial margin. Calculate the amount of initial margin. To what level Nifty futures should rise to get a percentage gain of 5%. [1+2]

Answer to 6 (b):

$$\begin{aligned}\text{Initial margin} &= 10\% \text{ of Transaction value of futures.} \\ &= 0.10 \times 1300 \times 250 \\ &= ₹ 32500\end{aligned}$$

$$\begin{aligned}\text{Now gain} &= 5\% = 0.05 = \text{Return} \div \text{Investment} \\ &= \text{Return} \div 32500\end{aligned}$$

$$\therefore \text{Return} = ₹ 1625$$

$$\text{i.e., Return per unit} = 1625 / 250 = ₹ 6.50$$

$$\therefore \text{Index futures should rise to } 1306.50.$$

- 6 (c). The annual interest rate is 5% in the United States and 8% in the UK. The spot exchange rate is £/\$ -1.50 and forward exchange rate, with one year maturity, is £/\$ = 1.48 In view of the fact that arbitrageur can be borrow \$ 1000000 at current spot rate, calculate the arbitrageur profit/ loss? [5]

Answer to 6 (c):

We first verify the interest rate parity to decide first, whether any arbitrage exists.

Answer to MTP_Final_Syllabus 2008_Jun2015_Set 1

We have spot = 1£ = \$ 1.50

$$\text{LHS} = (1+r_n) = 1 + 0.05 = 1.05$$

$$\text{RHS} = F/S (1+r_f) = 0.987 \times (1 + 0.08) = 1.0656 \text{ (\$ return)}$$

Since LHS \neq RHS, parity does not exist, and there exists an opportunity to arbitrage.

Since LHS is lower, the borrowing would be done in dollars. The borrowed money would be converted to £ and invested. The profit can be calculated as follows:

Assume borrowing \$1000000. The repayment would be at the rate of 5% in 12 months i.e., \$ 1000000 \times 1.05 = \$1050000. \$1000000 converted to £ at spot would yield £666667. This on deposit for 12 months would yield £720000. This converted back to \$ would give us \$1065600.

Thus our net arbitrage profit would be = \$1065600 - \$1050000 = \$15600.

Note: Inverse Notations £ / \$ - 1.50 used.

- 7 (a). For imports from UK, Philadelphia Ltd. of USA owes £650000 to London Ltd., payable on May, 2014. It is now 12 February, 2015. The following future contracts (contract size £62,500) are available on the Philadelphia exchange:**

Expiry	Current futures rate
May	1.4900 \$/£ 1
June	1.4960 \$/£ 1

- I. Illustrate how Philadelphia Ltd. can use future contracts to reduce the transaction risk if, on 20 May the spot rate is 1.5030 \$/£ 1 and June futures are trading at 1.5120 \$/£. The spot rate on 12 February is 1.4850 \$/£ 1.
- II. Calculate the hedge efficiency and comment on it. [8+2]

Answer to 7(a):

- I. Philadelphia Ltd. of USA owes £ 650000 to London Ltd., payable on May, 2015. This company would therefore buy Futures contracts. Since information on June Contracts are given for both spot and expiry, and the firm can buy either May or June Futures for hedging, we illustrate the hedging procedure by using June Futures:

$$\text{Value of exposure today (12th February)} = \text{£}650000 \times 1.4850 = \text{\$}965250$$

Answer to MTP_Final_Syllabus 2008_Jun2015_Set 1

Since each contract size = £ 62,500, the firm can buy 10 June expiry contracts at \$1.4960/£ i.e. can cover the exposure to the extent of £625000, thus leaving the balance £650000 - £625000 = £25,000 uncovered. When the payment is due in May, the spot rate would be 1.5030 \$/£ and the June contracts would be trading at 1.5120 \$/£.

At expiry, the value of exposure would increase to £650000 × 1.5030 = \$976950.

Therefore, increase in exposure = \$976950 - \$965250 = \$11,700.

However, since the firm bought futures at 1.4960, it can sell of the same at a higher rate of 1.5120/£.

This would result in a profit = $10 \times 62500 \times (1.5120 - 1.4960) = \10000 [Savings due to hedging]

Net loss = \$11700 - \$10000 = \$1700.

- II. Owing to hedging in the futures market the company could reduce its losses by \$10000. i.e., out of a possible loss of \$ 11700, \$10000 could be saved owing to hedging. Thus hedging thus hedging efficiency is = $\$10000/\$11700 = 85.5\%$, which is reasonably good, despite the inability of the firm to hedge 100% of the exposure.

7 (b). State currency futures? List the steps involved in the technique of hedging through futures. [5]

Answer to 7 (b):

A currency futures contract is a derivative financial instrument that acts as a conduct to transfer risks attributable to volatility in prices of currencies. It is a contractual agreement between a buyer and a seller for the purchase and sale of a particular currency at a specific future date at a predetermined price. A futures contract involves an obligation on both parties to fulfill the terms of the contract. A futures contract can be bought or sold only with reference to the USD.

There are six steps involved in the technique of hedging through futures:

- (i) Estimating the target income (with reference to the spot rate available on a given date.)
- (ii) Deciding on whether Futures Contracts should be bought or sold.
- (iii) Determining the number of contracts (since contract size is standardised).
- (iv) Identifying profit or loss on target outcome.
- (v) Closing out futures position and
- (vi) Evaluating profit or loss on futures.

Answer to MTP_Final_Syllabus 2008_Jun2015_Set 1

- 8 (a). 'Fixed Costs are unrelated to output and irrelevant for decision making purpose in all circumstances'.- Justify. [3]

Answer to 8(a):

Fixed Costs are unrelated to output and are generally irrelevant for decision making purpose. However, in the following circumstances, Fixed Costs become relevant for decision-making:

1. When Fixed Costs are specifically incurred for any contract,
2. When Fixed Costs are incremental in nature,
3. When the fixed portion of Semi-Variable Cost increases due to change in level of activity consequent to acceptance of a contract,
4. When Fixed Costs are avoidable or discretionary,
5. When Fixed Costs are such that one cost is incurred in lieu of another (the difference in costs will be relevant for decision-making).

- 8 (b). A company wants to invest in a machinery that would cost ₹ 50,000 at the beginning of year 1. It is estimated that the net cash inflows from operations will be ₹18,000 per annum for 3 years; if the company opts to service a part of the machine at the end of year 1 at ₹10,000 and the scrap value at the end of year 3 will be ₹12,500. However, if the company decides not to service the part, it will have to be replaced at the end of year 2 at ₹15,400. But in this case, the machine will work for the 4th year also and get operational cash inflow of ₹18,000 for the 4th year. It will have to be scrapped at the end of year 4 at ₹9,000. Assuming cost of capital at 10% and ignoring taxes, will you recommend the purchase of this machine based on the net present value of its cash flows?

If the supplier gives a discount of ₹ 5,000 for purchase, what would be your decision? (The present value factors at the end of years 0, 1, 2, 3, 4, 5 and 6 are respectively 1, 0.9091, 0.8264, 0.7513, 0.6830, 0.6209 and 0.5644). [5+2]

Answer to 8(b):

(i) Statement showing evaluation of mutually exclusive proposals

Particulars	Time	P. V. Factor	Service Part		Replace Part	
			Amount	P.V.	Amount	P.V.
Cash Outflows:						
Cost of machinery	0	1	50,000	50,000	50,000	50,000
Service cost	1	0.9091	10,000	9,091	---	---
(+) Replace Part	2	0.8264	---	---	15,400	12,727
P.V. of Cash Outflows (A)				59,091		62,727

Answer to MTP_Final_Syllabus 2008_Jun2015_Set 1

Cash Inflows:						
Cash inflows from operation	1-3	2.4869	18,000			
	1-4	3.1699		44,764	18,000	57,058
Scrap value of machine	3	0.7513	12,500	9,391		
	4	0.6830			9,000	6,147
P.V. of Cash Inflows (B)				54,155		63,205
NPV (B) – (A)				(4,936)		478

Advise: Purchase machine & Replace the part at end of second year.

(ii) If the supplier gives a discount of ₹5,000 on purchase of machine

Proposals	Service Part	Replace Part
NPV	64	5,478
Cumulative P.V.A.F.	2.4869	3.1699
Equivalent Annual NPV	25.73	1,728

Advise: Purchase machine A Replace the part at end of second year.

8 (c). S Ltd. has ₹ 10,00,000 allocated for capital budgeting purposes. The following proposals and associated profitability indexes have been determined: **[5]**

Project	Amount (₹)	Profitability Index
1	3,00,000	1.22
2	1,50,000	0.95
3	3,50,000	1.20
4	4,50,000	1.18
5	2,00,000	1.20
6	4,00,000	1.20

Advice which of the above investment should be undertaken. Assume that projects are indivisible and there is no alternative use of the money allocated for capital budgeting.

Answer to MTP_Final_Syllabus 2008_Jun2015_Set 1

Answer to 8(c):

Computation of NPV of Viable Projects:

Project	NPV(₹)	
1	$3,00,000 \times 0.22$	= 66,000
3	$3,50,000 \times 0.20$	= 70,000
4	$4,50,000 \times 0.18$	= 81,000
5	$2,00,000 \times 0.20$	= 40,000
6	$4,00,000 \times 0.20$	= 80,000

Combinations	Initial Cash Outflows (₹)	Overall N.P.V. (₹)
1,3,5	8,50,000	1,76,000
1,4,5	9,50,000	1,87,000
1,5,6	9,00,000	1,86,000
3,4,5	10,00,000	1,91,000
3,5,6	9,50,000	1,90,000
4,6	8,50,000	1,61,000

Advise: Best combination of projects = 3, 4, 5.

Note: Project 2 should not be considered as it provides a negative NPV.