

PAPER-14: ADVANCED FINANCIAL MANAGEMENT

Answer to PTP_Final_Syllabus 2012_Jun2015_Set 1

The following table lists the learning objectives and the verbs that appear in the syllabus learning aims and examination questions:

	Learning objectives	Verbs used	Definition
LEVEL C	KNOWLEDGE What you are expected to know	List	Make a list of
		State	Express, fully or clearly, the details/facts
		Define	Give the exact meaning of
	COMPREHENSION What you are expected to understand	Describe	Communicate the key features of
		Distinguish	Highlight the differences between
		Explain	Make clear or intelligible/ state the meaning or purpose of
		Identify	Recognize, establish or select after consideration
	APPLICATION How you are expected to apply your knowledge	Illustrate	Use an example to describe or explain something
		Apply	Put to practical use
		Calculate	Ascertain or reckon mathematically
		Demonstrate	Prove with certainty or exhibit by practical means
		Prepare	Make or get ready for use
		Reconcile	Make or prove consistent/ compatible
		Solve	Find an answer to
	ANALYSIS How you are expected to analyse the detail of what you have learned	Tabulate	Arrange in a table
		Analyse	Examine in detail the structure of
		Categorise	Place into a defined class or division
		Compare and contrast	Show the similarities and/or differences between
		Construct	Build up or compile
		Prioritise	Place in order of priority or sequence for action
	SYNTHESIS How you are expected to utilize the information gathered to reach an optimum conclusion by a process of reasoning	Produce	Create or bring into existence
		Discuss	Examine in detail by argument
		Interpret	Translate into intelligible or familiar terms
EVALUATION How you are expected to use your learning to evaluate, make decisions or recommendations	Decide	To solve or conclude	
	Advise	Counsel, inform or notify	
	Evaluate	Appraise or assess the value of	
		Recommend	Propose a course of action

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PAPER-14: Advanced Financial Management

Time Allowed: 3 hours

Full Marks: 100

This paper contains 5 questions. All questions are compulsory, subject to instruction provided against each question. All workings must form part of your answer.

Assumptions, if any, must be clearly indicated.

Question No. 1. (Answer all questions. Each question carries 2 marks)

(a) A company is considering Projects X and Y with following information: [2]

Project	Expected NPV (₹)	Standard deviation (₹)
X	1,22,000	1,10,000
Y	2,25,000	1,70,000

Evaluate the project which may be recommended based on coefficient of variation as a measure of risk.

Answer to (a):

$$CV = \frac{SD}{ENPV}$$

$$CV_x = \frac{1,10,000}{1,22,000} = 0.902$$

$$CV_y = \frac{1,70,000}{2,25,000} = 0.756$$

On the basis of Co-efficient of Variation (C.V). Project Y appears to be less risky and hence should be accepted.

(b) Explain Non-financial Intermediaries. [2]

Answer to (b):

Non-financial intermediaries are those institutions which do the loan business but their resources are not directly obtained from the savers. Many non-banking institutions also act as intermediaries and when they do so they are known as non-banking financial intermediaries, e.g. LIC, GIC, IDBI, IFC, NABARD.

(c) The Beta co-efficient of equity stock of TECHBOARD LTD. is 1.6. The risk-free of return is 12% and the required rate of return is 18% on the market portfolio. If the dividend expected during the coming year is ₹3.75 and the growth rate of dividend and earnings is 10%, find out at what price the stock of Techboard Ltd. can be sold (based on the CAPM)? [2]

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Answer to (c):

Expected rate of return: (By applying CAPM)

$$\begin{aligned}R_e &= R_f + \beta_f (R_m - R_f) \\ &= 12\% + 1.6 (18\% - 12\%) \\ &= 12\% + 9.6\% = 21.6\%\end{aligned}$$

Price of stock : (with the use of dividend growth model formula)

$$R_e = D_t/P_0 + g$$

$$0.216 = 3.75/(P_0 - 0.10)$$

$$\text{Or, } P_0 = 3.75/(0.216 - 0.10)$$

$$= 3.75/0.116 = ₹32.33$$

(d) State Reverse Book Building Process.

[2]

Answer to (d):

It is method of buy-back of securities. It is an efficient price discovery mechanism adopted when the company aims to buy the Shares from the public and other Shareholders. This is generally done when the company wishes to delist itself from the trading exchanges.

(e) PNB Ltd. placed ₹75 Crores in overnight call with a foreign bank for a day in overnight call.

The call ruled at 7.35% p.a. Calculate the amount the investor would receive from the foreign bank the next day. [2]

Answer to (e):

Amount placed in call = ₹75 crores

Interest = 7.35% p.a.

Amount receivable next day = Principal + Interest for a day

$$\begin{aligned}&= ₹ 75 \text{ Crores} + 75 \text{ crores} \times \frac{1}{365} \times \frac{7.35}{100} \\ &= ₹ 75,01,51,028\end{aligned}$$

(f) In September 30, 2014, a three-month Put on VINTEX LTD.'s stock with an exercise price of ₹150 sold for ₹13.64. The stock price was ₹140.00. The risk-free rate was 6% per annum. Calculate the price to be quoted/paid for a CALL on Vintex Ltd.'s stock with same maturity and exercise price.

[Given. PVIF (6%, ¼ year) = 0.9852] , PVIF (6%, ½ year) = 0.9709 and PVIF (6%, 1 year) = 0.9434] [2]

Answer to (f):

Based on put call parity theorem,

$$C - P = S - PV (EP) \text{ or, } C = P + S - PV(EP).$$

$$\begin{aligned}\text{Thus, } C (\text{call}) &= 13.64 + 140 - 150 \times 0.9852 \\ &= 153.64 - 147.78 = ₹5.86\end{aligned}$$

Thus, Price of three month call = ₹5.86

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- (g) A treasury bill is maturing on 28-Feb- 2015 is trading in the market on 3rd March 2014 at a price of ₹92.8918. Identify the discount rate inherent in this price. [2]

Answer to (g):

The formula for calculation of yield of a T- Bill is $Y = \left(\frac{F-P}{P} \right) \times \frac{365}{M} \times 100$

Here P = 92.8918, F = 100, M = 360 days [period from 03/03/14 to 28/02/15 – remember exclude the maturity date]

$$Y = \left(\frac{100-92.8918}{92.8918} \right) \times \frac{365}{360} \times 100 = 7.76\%$$

- (h) Mr. Mohit is willing to purchase a 5 years ₹ 10000 par value PSU bond is having a coupon rate of 9%. His required rate of return is 10%. How much Mr. Mohit should pay to purchase the bond if it matures at par?

[Given: PVIFA (10%, 5 years) = 3.791 and PVIF (10%, 5 years) = 0.621]

[Given: PVIFA (9%, 5 years) = 3.890 and PVIF (9%, 5 years) = 0.650] [2]

Answer to (h):

If the Bond matures at par $B_n = ₹10,000$.

Each interest = ₹ 900 $(10,000 \times 0.09)$, $K_d = 10\%$

$$B_0 = ₹900 \times 3.791 + 10,000 \times 0.621$$

$$= ₹9621.90$$

- (i) Define Out-of-Pocket Cost. [2]

Answer to (i):

Out-of-Pocket Cost is those costs that entail current or near future cash outlays for the decision at hand. Such costs are relevant for decision - making, as these will occur in near future. This cost concept is a short-run concept and is used in decisions on fixing Selling Price in recession, Make or Buy, etc. Out-of-Pocket costs can be avoided or saved if a particular proposal under consideration is not accepted.

- (j) Mr. Kumar is a fund manager of an equity fund is expected to provide risk premium of 10% and standard deviation of returns of 16%. Miss Ankita, a client of Mr. Kumar chooses to invest ₹1,05,000 in equity fund and ₹45,000 in T-Bills. If T – Bills are trading at 7% p.a. Estimate the expected return and standard deviation of return on the portfolio for Miss Ankita. [2]

Answer to (j):

Expected return on Equity fund = 7.00 + 10.00 = 17%

Expected return on Portfolio of Miss Ankita:

$$0.70 \times 17 + 0.30 \times 7 = 14\%$$

Expected Standard deviation of the return on Port folio

$$= 0.70 \times 0.16 + 0.30 \times 0$$

$$= 11.20\%$$

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Question No. 2. (Answer **any three** questions. Each question carries **8 marks**)

2 (a). A has invested in three mutual fund schemes as per details given below:

Particulars	MFA	MFB	MFC
Date on investment	1.12.14	1.1.15	1.3.15
Amount of investment	₹50000	₹ 1 lakh	₹50000
NAV at entry date	₹ 10.50	₹ 10.00	₹ 10.00
Dividend received up to 31.3.04	₹950	₹1400	Nil
NAV as on 31.3.04	₹ 10.40	₹10.15	₹9.80

Required:

Tabulate the effective yield on per annum basis in respect of each of the three schemes to Mr. A up to 31.03.15. [8]

Answer to 2 (a):

Particulars	MFA	MFB	MFC
Date on investment	1.12.14	1.1.15	1.3.15
Amount of investment	₹50000	₹ 1 lakh	₹50000
NAV at entry date	₹ 10.50	₹ 10.00	₹10.00
Dividend received up to 31.3.15	₹950	₹1400	Nil
NAV as on 31.3.15	₹ 10.40	₹10.15	₹9.80
Number of units issued	$50000/10.5 = 4762$	$1 \text{ lakh}/10 = 10000$	$50000/10 = 5000$
Dividend per unit	$950/4762 = 0.20$	$1400/10000 = 0.14$	Nil
Capital Gains per unit	$(10.4-10.5) = -0.10$	$(10.15-10.00) = +0.15$	$(9.80-10) = -0.20$
Total	0.10	0.29	-0.20
Yield	$0.10/10.5 = 0.95\%$	$0.29/10 = 2.9\%$	$-0.2/10 = -2\%$
Yield per annum =	2.85%	11.60%	-24%
Yield x (12/months of investment)			

2(b)(i). Satendra invested ₹1,00,000 in debt-oriented fund when the NAV was ₹8.05, and sold the units allotted when the NAV was ₹ 8.55 after one year. Assume that there existed an entry load of 2% and no exit load. He received ₹ 1 per unit as dividend which is taxable at 30% during the year. Ignore capital gains tax. Compute after tax rupee return from this investment. [5]

2(b)(ii). NBFC are not being compulsorily registered with RBI. - Justify. [3]

Answer to 2(b)(i):

Satendra invested ₹1,00,000, when NAV was ₹8.05 and the sale price was = $8.05 \times 1.01 = ₹ 8.1305$. At this price he was issued 12,300 ($1,00,000/8.1305$) units. On this he received dividend = $12,300 \times$

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1 = ₹12,300. However, dividends are taxable at 30%. His post tax receipt 8,610. Now if he sells after a year when the NAV is ₹8.55, he gets full value as there is no exit load.

Rupee return in value

= (Post Tax Div. + (Repurchase Price - Sale Price) x No. of Units

= 8,610 + (8.55 - 8.1305) x 12,300

= 13,769.85

Rupee return in %

= 13,769.85/100000

= 13.77%

Answer to 2(b)(ii):

In terms of Section 45-IA of the RBI Act, 1934, no Non-banking Financial company can commence or carry on business of a non-banking financial institution without a) obtaining a certificate of registration from the Bank and without having a Net Owned Funds of ₹ 25 lakhs (₹ two crore since April 1999). However, in terms of the powers given to the Bank, to obviate dual regulation, certain categories of NBFCs which are regulated by other regulators are exempted from the requirement of registration with RBI viz. Venture Capital Fund/Merchant Banking companies/Stock broking companies registered with SEBI, Insurance Company holding a valid Certificate of Registration issued by IRDA, Nidhi companies as notified under Section 620A of the Companies Act, 1956, Chit companies as defined in clause (b) of Section 2 of the Chit Funds Act, 1982, Housing Finance Companies regulated by National Housing Bank, Stock Exchange or a Mutual Benefit company.

2(c)(i). List five important regulations prescribed by SEBI for the investments that can be made by a Mutual Fund. [5]

2(c)(ii). The unit price of TSS Scheme of a mutual fund is ₹ 100. The public offer price (POP) of the unit is ₹ 102.04 and the redemption price is ₹ 99.50. Calculate: (1) Front-end Load, and (2) Back-end Load. [1½+1½]

Answer to 2(c)(i):

SEBI REGULATIONS FOR INVESTMENTS OF A MUTUAL FUND: The investments of a mutual fund are governed by a set of regulations of the SEBI and the five important ones are as under:

- (i) In all the schemes taken together, a mutual fund shall not own more than 10% of the company's paid up capital;
- (ii) A scheme shall not invest more than 15% of the NAV in debt instruments issued by a single issuer which are rated not below investment grade by an authorized credit rating agency;
- (iii) Barring certain exceptions, a scheme shall not invest more than 10% of its NAV in the equity shares or equity related instruments of one company;
- (iv) A scheme shall not invest more than 5% of its NAV in unlisted equity shares or equity related instruments in case of an open ended scheme and 10% of its NAV in case of close ended scheme;
- (v) Mutual funds shall mark all investments to market.

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Answer to 2(c)(ii):

(1) Calculation of Front-end Load (%)

We know that Sale Price = NAV (1 + Front-end Load %)

Since, Unit Price = ₹ 100.00, we have NAV = ₹100. We are given,

Sale Price = ₹ 102.04

Therefore we have Front-end Load% = $102.04/100 - 1 = 2.04\%$

(2) Repurchase Price = NAV (1 - Back-end Load %)

Since, Unit Price = ₹ 100.00, we have NAV = ₹ 100. We are given, Repurchase Price = ₹99.50

Therefore we have Back-end Load% = $1 - 99.5/100 = 0.5\%$

2(d)(i). The RBI offers 91 -day T-Bill to raise ₹15000 Crores. The following bids have been received.

Bidder	Bid rate	Amount (₹ Crores)
A	98.95	18,000
B	98.93	7,000
C	98.92	10,000

(1) Calculate the yield for each of the price at which the bid has been made.

(2) Who are the winning bidders if it was a yield based auction, and how much of the security will be allocated to each winning bidder? [3+2]

2(d)(ii). Distinguish between 'Inter Corporate Deposits' and 'Public Deposits'. [3]

Answer to 2(d)(i):

(1) Yield = $Y = \left(\frac{F-P}{P} \right) \times \frac{365}{M} \times 100$ where, M = 91 days for all.

A = 4.26% [Price P = 98.95]

B = 4.34% [Price P = 98.93]

C = 4.38% [Price P = 98.92]

(2) As this is a yield based auction, and since the entire amount of ₹ 5,000 Crores can be sourced at the lowest yield of ₹ 4.26% itself, only A's bid would be accepted for ₹ 15,000 Crores.

Answer to 2(d)(ii):

Inter-corporate Deposits: (i) Short term finance; (ii) Deposits made by one company to another company and are subject to the provisions of the Companies Act 1956; (iii) Rate of interest varies depending upon amount involved and time period; and (iv) the risk is very high.

Public Deposits: (i) Both short term and medium term finance; (ii) Deposits from public and shareholders, subject to the rules prescribed by RBI; (iii) The maximum amount that can be raised, maturity period, and procedures as per conditions laid down by the RBI; (iv) These deposits are unsecured loans and are used for working capital requirements.

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Question No. 3. (Answer **any two** questions. Each question carries **10 marks**)

3(a)(i). Suppose a dealer Rupam quotes 'All-in-cost' for a generic swap at 10% against six month LIBOR flat. If the notional principal amount of swap is ₹7,00,000,

(1) Calculate Semi-Annual fixed payment.

(2) Find the first floating rate payment for (1) above if the six month period from the effective date of swap to the settlement date comprises 183 days and that the corresponding LIBOR was 8% on the effective date of swap.

(3) In 2 above, if settlement is on 'Net' basis, how much the fixed rate payer would pay to the floating rate payer?

Generic swap is based on 30/360 days basis.

[2+2+2]

3(a)(ii). List the benefits of Rolling Settlement.

[4]

Answer to 3(a)(i):

Computation of Factors

Factor	Notation	Value
Notional Principal	P	7,00,000
Time	N	180 days
All in Cost Rate	R	0.10

(1) Computation of Semi Annual Fixed Rate Payment

Semi-Annual Fixed Rate Payment = $P \times (N \div 360) \times R$

= $7,00,000 \times (180 \div 360) \times 0.10$

= $7,00,000 \times 0.5 \times 0.10 = ₹35,000/-$

(2) Computation of Floating Rate Payment

Floating Rate Payment = $P \times (N \div 360) \times \text{LIBOR}$

Where N = Period from the effective date of SWAP to the date of Settlement

= $7,00,000 \times (183 \div 360) \times 0.08$

= $7,00,000 \times (0.5083) \times 0.08 = ₹28,465.$

(3) Computation of Net Amount

Net Amount to be paid by the Person Requiring Fixed Rate Payment = Fixed Rate Payment

Less Floating Rating Payment = $₹35,000 - ₹28,465 = ₹6,535.$

Answer to 3 (a)(ii):

(1) In rolling settlements, payments are quicker than in weekly settlements. Thus, investors benefit from increased liquidity,

(2) It keeps cash and forward markets separate,

(3) Rolling settlements provide for a higher degree of safety,

(4) From an investor's perspective, rolling settlement reduces delays. This also reduces the tendency for price trends to get exaggerated. Hence, investors not only get a better price but can also act at their leisure.

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3 (b)(i). Following are the details of cash inflows and outflows in foreign currency denominations of Mac Co., an Indian export firm, which have no foreign subsidiaries —

Currency	Inflow	Outflow	Spot rate	Forward rate
US \$	4,00,00,000	2,00,00,000	48.01	48.82
French Franc (F Fr)	2,00,00,000	80,00,000	7.45	8.12
UK £	3,00,00,000	2,00,00,000	75.57	75.98
Japanese Yen	1,50,00,000	2,50,00,000	3.20	2.40

(1) Determine the net exposure of each foreign currency in terms of Rupees.

(2) Are any of the exposure positions off-setting to some extent? [6+2]

3(b)(ii). A sold in June Nifty futures contract for ₹3,60,000 on June 15, For this he had paid an initial margin of ₹34,000 to his broker. Each Nifty futures contract is for the delivery of 200 Nifties. On June 25, the index was closed on 1925. How much profit / loss A has made? [2]

Answer to 3(b)(i):

(1) Computation of Net Exposure

Particulars	US \$	F Fr	UK £	Japan Yen
Inflow (in Lakhs)	400.00	200.00	300.00	150.00
Less: Outflow	(200.00)	(80.00)	(200.00)	(250.00)
Net Exposure (Foreign Currency Terms)	200.00	120.00	100.00	(100.00)
Spot Exchange Rate	48.01	7.45	75.57	3.20
Net Exposure (in Rupee Terms based on Spot Exchange Rate)	9602 [200x48.01]	894 [120 x 7.45]	7557 [100 x 75.57]	(32) [100 x 3.20/10]

Particulars	US \$	F Fr	UK£	Japan Yen
Forward Rate [₹ , FC]	48.82	8.12	75.98	2.40
Less: Spot Exchange Rate [₹ / FC]	48.01	7.45	75.57	3.20
Forward Premium/ (Discount)	0.81	0.67	0.41	(0.80)
Net Exposure in Rupee Terms based on extent of uncertainty represented by Premium / (Discount)	162.0 [200 x 0.81]	80.4 [120 x 0.67]	41.0 [100 x 0.41]	8.0 [[(100)x (0.8)/ 10]

(2) Off Setting Position:

(a) Net Exposure in all the currencies are offset by better forward rates. In the case of USD, F Fr and UK Pound, the net exposure is receivable, and the forward rates are quoted at a premium for these currencies.

(b) In case of Japanese Yen, the net exposure is payable, and the forward rate is quoted at a discount. Therefore, a better forward rate is also offsetting the net payable in Japanese Yen.

Answer to 3(b)(ii):

Sale Price per NIFTY Future

$$\begin{aligned}
 &= \text{Contract Amount} \div \text{Lot size} \\
 &= ₹3,60,000 \div 200 \\
 &= ₹1,800
 \end{aligned}$$

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Futures Price as on June 25

$$= ₹ 1,925$$

Loss on Sale of Futures Contract

$$= (1,925 - 1,800) \times 200$$

$$= ₹25,000.$$

3(c)(i). The following quotes are available.

Spot (\$/Euro) 0.8385/0.8391

3-m swap points 20/30

Spot (\$/Pound) 1.4548/1.4554

3-m swap points 35/25

Find the 3-m (€/£) outright forward rates.

[5]

3(c)(ii). Describe swaps. Discuss its necessity and financial benefits associated with a swap transactions. **[2+2+1]**

Answer to 3(c)(i)

Given $\$/\text{€} = 0.8385 / 0.8391$

3M fwd = 0.8405 / 0.8421

(Swap points ascending order \longrightarrow add to find forward rates)

$\$/\text{£} = 1.4548/1.4554$

3M fwd = 1.4513 / 1.4529

(Swap points descending order \longrightarrow deduct to find forward rates)

To find $\text{€} / \text{£}$ (3M outright forward rates)

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

We do not have a quote of $\text{€} / \text{\$}$, instead we have $\text{\$} / \text{€}$.

$$\text{Bid } (\text{€} / \text{£}) = 1/\text{Ask}(\text{\$} / \text{€}) \times \text{Bid}(\text{\$} / \text{£})$$

Substituting the values,

$$\text{Bid rate for } \text{€} / \text{£} = 1/0.8421 \times 1.4513 = 1.7234$$

Similarly Ask $(\text{€} / \text{£}) = 1/\text{Bid}(\text{\$} / \text{€}) \times \text{Ask}(\text{\$} / \text{£})$

$$= 1/0.8405 \times 1.4529 = 1.7286$$

\therefore 3M outright forward rates $(\text{€} / \text{£}) = 1.7234 / 1.7286$

Answer to 3(c)(ii):

Swaps Exchange of one obligation with another -- Financial swaps are funding technique, which permit a borrower to access one market and exchange the liability for another market / instrument - exchange one type of risk with another.

Necessity –

1. Difference in borrowers and investors preference and market access
2. Low cost device
3. Market saturation
4. Differences in financial norms followed by different countries.

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Financial Benefits Created by Swap Transactions

- The Theory of Comparative Advantage
- Information asymmetries.

Question No. 4. (Answer **any two** questions. Each question carries **8 marks**)

4 (a). Stocks P and Q have the following historical returns —

Year	2011	2012	2013	2014	2015
Stock P's Return (K)	-12.24	23.68	34.44	5.82	28.30
Stock Q's Return (K)	-7.00	25.55	44.09	2.20	20.16

You are required to calculate the average rate of return for each stock during the period 2011 to 2015. Assume that someone held a Portfolio consisting 60% of Stock P and 40% of Stock Q.

Calculate the realized rate of return on the Portfolio in each year from 2011 to 2015. Find out the average return on the Portfolio during the period. (You may assume that year ended on 31st March). [3+5]

Answer to 4 (a):

1. Calculation of average rate of return on Portfolio during 2011-2015

Year	Stock P's Return %	Stock Q's Return %
2011	-12.24	-7.00
2012	23.68	25.55
2013	34.44	44.09
2014	5.82	2.20
2015	28.30	20.16
Total	80.00	85.00
Average rate of return	80/5 years = 16%	85/5 years = 17%

2. Calculation of realized rate of return on Portfolio during 2011-2015

Year	Stock P			Stock Q			Total
	Proportion	Return	Net Return	Proportion	Return	Net Return	Net Return
1	2	3	4 = 3 x 2	5	6	7 = 5 x 6	8 = 4 + 7
2011	0.60	-12.24	-7.344	0.40	-7.00	-2.80	-10.144
2012	0.60	23.68	14.208	0.40	25.55	10.22	24.428
2013	0.60	34.44	20.664	0.40	44.09	17.636	38.30
2014	0.60	5.82	3.492	0.40	2.20	0.88	4.372
2015	0.60	28.30	16.98	0.40	20.16	8.064	25.044
			48.00			34.00	82.00

Average rate of return = ₹82.00 ÷ 5 = 16.40%

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4(b)(i). Describe the techniques used in Industry Analysis.

[2]

4(b)(ii). There are two portfolios L and M. known to be on the minimum variance set for a population of three securities A, B and C. The weights for each of the portfolios are given below:

	WA	WB	WC
Portfolio L	0.21	0.60	0.19
Portfolio M	0.20	0.65	0.15

Ascertain the stock weights for a portfolio made up with investment of ₹ 3,000 in L and ₹ 2,000 in M. [4]

4(b)(iii). The risk free return is 8 per cent and the return on market portfolio is 14 per cent. If the last dividend on Share 'A' was ₹5.00 and assuming that its dividend and earnings are expected to grow at the constant rate of 7 per cent. The beta of share 'A' is 2.50. Compute the intrinsic value of share A. [2]

Answer to 4(b)(i):

Techniques Used in Industry Analysis:

- (i) **Regression Analysis:** Investor diagnoses the factors determining the demand for output of the industry through product demand analysis. The following factors affecting demand are to be considered - GNP, disposable income, per capita consumption / income, price elasticity of demand. These factors are then used to forecast demand using statistical techniques such as regression analysis and correlation.
- (ii) **Input - Output Analysis:** It reflects the flow of goods and services through the economy, intermediate steps in production process as goods proceed from raw material stage through final consumption. This is carried out to detect changing patterns/trends indicating growth/decline of industries.

Answer to 4(b)(ii):

Particulars	WA	WB	WC	Total
Portfolio L	0.21	0.60	0.19	
Investment in securities (Weight x investment)	630	1,800	570	3,000
Portfolio M	0.20	0.65	0.15	
Investment in securities (Weight x investment)	400	1,300	300	2,000
Total investment in securities	1,030	3,100	870	5,000
Weight in portfolio	0.206	0.620	0.174	

Weight in portfolio is computed as total securities/size of portfolio; for example weight of securities A is $1,030/5,000 = 0.206$, similar for B and C.

Answer to PTP_Final_Syllabus 2012_Jun2015_Set 1

Answer to 4(b)(iii):

Computation of Expected Return

$$\begin{aligned} \text{Expected Return } [E(R_A)] &= R_F + [\beta_A \times (R_M - R_F)] \\ &= 0.08 + [2.5 \times (0.14 - 0.08)] \\ &= 0.08 + 2.5 (0.14 - 0.08) = 0.08 + 0.15 = 0.23 \\ \text{i.e., } K_e &= 23\% \end{aligned}$$

$$\begin{aligned} \text{Intrinsic Value of share} &= D_1 \div (K_e - g) = D_0 \times (1 + g) \div (K_e - g) \\ &= 5 \times (1 + 0.07) \div (0.23 - 0.07) = ₹ 33.44 \end{aligned}$$

The Intrinsic Value of share A is ₹ 33.44.

4(c)(i). Mention any four important factors that you would consider for investment decisions in portfolio management. [2]

4(c)(ii). The Capital of J Ltd, an exclusive software support service provider to B Ltd, is made up of 40% Equity Share Capital, 60% Accumulated Profits and Reserves. J does not have any other clients. The sensx yields a return of 15%. The risk-less return is measured at 9.25%.

- (1) If the shares of J Ltd carry a Beta (β_J) of 1.6, compute cost of capital, and also the beta of activity support service to B Ltd.**
- (2) If there is another client, K Ltd, accounting for 45% of Assets of J Ltd, with a Beta of 1.70, compute the Beta of B Ltd, so that the equity beta of 1.60 is not affected. In such a case, find out the expected return from B Ltd and K Ltd. [(2+2)+(1+1)]**

Answer to 4(c)(i):

Factors are:

(i) Type of securities; (ii) Proportion of investment in fixed interest / dividend securities; (iii) Identification of industry (i.e., which particular industry shows potential of growth; (iv) Selection of company; (v) Objectives of portfolio; (vi) Timing and quantity of purchase of shares; (vii) Risk tolerance (i.e., conservative investors are risk-averse and aggressive investors generally dare to take risk).

Answer to 4 (c)(ii):

(1) Computation of Cost of Project & Beta of Project (Software Services to B Ltd)

Description of Factor	Measure
<ul style="list-style-type: none"> • Capital Structure of J Ltd • Nature of Capital Structure of J • Beta of Equity of J Ltd [β_E] • Project Status (Multiple or Single) • Project Beta (Beta of service to B = β_B) 	<p>All Equity Unlevered 1.60 Single To be ascertained</p>

Answer to PTP_Final_Syllabus 2012_Jun2015_Set 1

<ul style="list-style-type: none">• Rule for Unlevered Firm with Single Project• Therefore, Beta of Software Services to B Ltd	$\beta_U = \beta_J$ 1.60
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Cost of Capital

$$\begin{aligned} \text{Cost of Equity (K}_E) &= \text{Return expected on Shares of J Ltd (i.e. } E(R_J)) \\ K_E &= \text{Expected Return on J under CAPM} \\ &= R_F + \beta_J \times (R_M - R_F) \\ &= 9.25\% + [1.60 \times (15\% - 9.25\%)] \\ &= 9.25\% + [1.60 \times 5.75\%] \\ &= 9.25\% + 9.20\% \\ &= 18.45\% \end{aligned}$$

Beta of Services to B Ltd (Multiple Project Model)

Beta of J Shares Ltd (β_J) under Multiple Project scenario = Weighted Average of Betas of Projects

$$\begin{aligned} \beta_J &= W_B \times \beta_B + W_K \times \beta_K \\ 1.60 &= [(1 - 45\%) \times \beta_B] + [45\% \times 1.70] \\ 1.60 &= 0.55 \times \beta_B + 0.765 \\ 0.55 \beta_B &= 1.60 - 0.765 \\ \beta_B &= 0.835 \div 0.55 \\ &= 1.518 \end{aligned}$$

Beta of B Ltd (β_B) should be 1.518

(2) Expected Return on Project B and Project K (Under CAPM Method)

Expected Return on Project B [$E(R_B)$]

$$\begin{aligned} &= R_F + [\beta_B \times (R_M - R_F)] \\ &= 9.25\% + [1.518 \times (15\% - 9.25\%)] \\ &= 9.25\% + [1.518 \times 5.75\%] \\ &= 9.25\% + 8.7285\% \\ &= \mathbf{17.9785\%} \end{aligned}$$

Expected Return on Project K [$E(R_K)$]

$$\begin{aligned} &= R_F + [\beta_K \times (R_M - R_F)] \\ &= 9.25\% + [1.70 \times (15\% - 9.25\%)] \\ &= 9.25\% + [1.70 \times 5.75\%] \\ &= 9.25\% + 9.775\% \\ &= 19.025\% \end{aligned}$$

Answer to PTP_Final_Syllabus 2012_Jun2015_Set 1

Question No. 5. (Answer **any two** questions. Each question carries **10 marks**)

5 (a)(i). Company Z is operating an elderly machine that is expected to produce a net cash inflow of ₹ 40,000 in the coming year and ₹ 40,000 next year. Current salvage value is ₹ 80,000 and next year's value is ₹ 70,000. The machine can be replaced now with a new machine, which costs ₹1,50,000, but is much more efficient and will provide a cash inflow of ₹ 80,000 p.a. year for 3 years. Company Z wants to know whether it should replace the equipment now or wait a year with the clear understanding that the new machine is the best of the available alternatives and that it in turn be replaced at the optimal point. Ignore tax. Take opportunity cost of capital as 10 per cent. Advise with reasons. [3+3+2]

5(a)(ii). XYZ Ltd adopts constant WACC approach and believes that its cost of debt and overall cost of capital is at 12% and 15% respectively. If the ratio of the market value of debt to the market value of equity is 0.9, calculate the rate of return that the Equity Shareholders will earn. Assume that there are no taxes. [2]

Answer to 5(a)(i):

Statement showing present value of cash inflow of new machine when it replaces elderly machine now

	₹	₹
Cash inflow of a new machine per year		80,000
Cumulative present value for 1-3 years @ 10%		2.48685
Present value of cash inflow for 3 years (₹ 80,000 x 2.48685)		1,98,948
Less: Cash outflow		
Purchase cost of new machine	1,50,000	
Less: Salvage value of old machine	80,000	70,000
N.P.V. of cash inflow for 3 years		1,28,948
Equivalent annual net present value of cash		51,852
Inflow of new machine (₹1,22,152/2.48685)		

Statement showing present value of cash inflow of new machine when it replaces elderly machine next year

	₹	₹
Cash inflow of a new machine per year		80,000
Cumulative present value for 1-3 years @ 12%		2.4019
Present value of cash inflow for 3 years (₹ 80,000 x 2.4019)		1,92,152
Less: Cash outflow		
Purchase cost of new machine	1,50,000	
Less: Salvage value of old machine	70,000	80,000
N.P.V. of cash inflow for 3 years		1,12,152
Equivalent annual net present value of cash Inflow (₹1,12,152/2.4019)		46,694

Answer to PTP_Final_Syllabus 2012_Jun2015_Set 1

Advise: Since the equivalent annual cash inflow of new machine now and next year is more than cash inflow (₹ 40,000) of an elderly machine the company Z is advised to replace the elderly machine now.

Company Z need not wait for the next year to replace the elderly machine since the equivalent annual cash inflow now is more than the next year's cash inflow.

Answer to 5(a)(ii):

Constant WACC implies the use of NOI or M&M Approach. Under M&M Approach,
 $K_e = K_o + \text{Risk Premium}$.

So, $K_e = K_o + (K_o - K_d) \text{ Equity/Debt}$

On substitution, we have, $K_e = 15\% + (15\% - 12\%) \times 90\% = 17.70\%$

5(b)(i). As an executive of a lending institution, what factors should you critically evaluate with respect to a large industrial project, from the perspectives of environmental and economic viability? [4]

5(b)(ii). A Production Manager is planning to produce a new product and he wishes to estimate the raw material requirement for that new product. On the basis of usage for a similar product introduced previously, he has developed a frequency distribution of demand in tonnes per day for a two month period. Used this data to simulate the raw material usage requirements for 7 days. Compute also expected value and comment on the result.

Demand Tonnes/day	Frequency No. of days
10	6
11	18
12	15
13	12
14	6
15	3

Random Number: 27, 13, 80, 10, 54, 60, 49.

[6]

Answer to 5(b)(i):

Factors to consider for critical evaluation of a large industrial project, from the perspectives of environmental and economic viability are:

- (i) Employment potential.
- (ii) Utilisation of domestically available raw material and other facilities.
- (iii) Development of industrially backward areas as per government policy.
- (iv) Effect of the project on the environment with particular emphasis on the pollution of water and air to be caused by it.
- (v) Arrangements for effective disposal of effluent as per government policy.
- (vi) Energy conservation devices, etc. employed for the project.

Other economic factors that influence the final approval of a particular project are:

Internal Rate of return (IRR) and Domestic resources Cost (DRC).

Answer to PTP_Final_Syllabus 2012_Jun2015_Set 1

Answer to 5(b)(ii):

Demand Tonnes/day	Frequency No. of days	Probability	Cumulative Probability	Random Numbers
10	6	$6 \div 60 = 0.10$	0.10	00 - 09
11	18	$18 \div 60 = 0.30$	0.40	10 - 39
12	15	$15 \div 60 = 0.25$	0.65	40 - 64
13	12	$12 \div 60 = 0.20$	0.85	65 - 84
14	6	$6 \div 60 = 0.10$	0.95	85 - 94
15	3	$3 \div 60 = 0.05$	1.00	95 - 99
	60	1.00		

The first seven random numbers (two digits only) are simulated:

Random No.	Corresponding demand Tonnes/day
27	11
13	11
80	13
10	11
54	12
60	12
49	12
	82

Mean requirement per = $82 / 7 = 11.7$ Tonnes

The expected value (EV) = $(10 \times 0.1) + (11 \times 0.3) + (12 \times 0.25) + (13 \times 0.2) + (14 \times 0.1) + (15 \times 0.05)$
= 12.05 Tonnes

The difference = $12.05 - 11.7 = 0.35$

This indicates that the small sample size of only 7 days had resulted in some error. A much larger sample should be taken and several samples should be simulated before the simulation results are used for decision making.

5 (c). VEDAVYAS Ltd. is considering two mutually exclusive projects M and project N. The Finance Director thinks that the project with higher NPV should be chosen, whereas the Managing Director thinks that the one with the higher IRR should be undertaken, especially as both projects have the same initial outlay and length of life. The company anticipates a cost of capital of 10% and the net after-tax cash flow of the projects are as follows:

Year	0	1	2	3	4	5
Cash flows (₹)						
Project M	(8,00,000)	1,40,000	3,20,000	3,60,000	3,00,000	80,000
Project N	(8,00,000)	8,72,000	40,000	40,000	16,000	12,000

Answer to PTP_Final_Syllabus 2012_Jun2015_Set 1

You are required to:

- (1) Calculate the NPV and IRR of each project.
- (2) State with reasons, which project you would recommended.
- (3) Explain the inconsistency in the ranking of the two projects.

Present value Table is given:

Year	0	1	2	3	4	5
PVIF at 10%	1.000	0.909	0.826	0.751	0.683	0.621
PVIF at 20%	1.000	0.833	0.694	0.579	0.482	0.402

(3+4)+2+1=10]

Answer to 5 (c).

(1) Calculation of NPV and IRR

NPV of Project M:

year	Cash Flows (₹)	Discount factor (10%)	Discounted Values(₹)	Discount factor (20%)	Discounted Values (₹)
0	(8,00,000)	1.000	(8,00,000)	1.000	(8,00,000)
1	1,40,000	0.909	1,27,260	0.833	1,16,620
2	3,20,000	0.826	2,64,320	0.694	2,22,080
3	3,60,000	0.751	2,70,360	0.579	2,08,440
4	3,00,000	0.683	2,04,900	0.482	1,44,600
5	80,000	0.621	49,680	0.402	32,160
NPV			1,16,520		(76100)

IRR of Project M:

At 20%, NPV is (-) 76,100 and at 10% NPV is 1,16,520

$$\therefore \text{IRR} = 10 + \frac{1,16,520}{1,16,520 + 76100} \times 10 = 10 + \frac{1,16,520}{1,92,620} \times 10 = 10 + 6.05 = 16.05\%$$

NPV of Project N:

year	Cash Flows (₹)	Discount factor (10%)	Discounted Values(₹)	Discount factor (20%)	Discounted Values (₹)
0	(8,00,000)	1.000	(8,00,000)	1.000	(8,00,000)
1	8,72,000	0.909	7,92,648	0.833	7,26,376
2	40,000	0.826	33,040	0.694	27,760
3	40,000	0.751	30,040	0.579	23,160
4	16,000	0.683	10,928	0.482	7,712
5	12,000	0.621	7,452	0.402	4,824
NPV			74,108		(10,168)

IRR of Project M:

At 20%, NPV = (-) 10,168 and at 10% NPV = 74,108

$$\therefore \text{IRR} = 10 + \frac{74,108}{74,108 + 10,168} \times 10 = 10 + \frac{74108}{84,276} \times 10 = 10 + 8.79\% = 18.79\%$$

Answer to PTP_Final_Syllabus 2012_Jun2015_Set 1

- (2) Both the projects are acceptable because they generate the positive NPV at the company's cost of capital at 10%. However, the company will have to select PROJECT M because it has higher NPV. If the company follows IRR method, then PROJECT N should be selected because of higher internal rate of return (IRR). But when NPV and IRR give contradictory results, a project with higher NPV is generally preferred because of higher return in absolute terms. Hence, Project M should be selected.
- (3) The inconsistency in the ranking of the projects arises because of the difference in the pattern of the cash flows. Project M's major cash flow occur mainly in the middle three years whereas project N generated the major cash flow in the first year itself.