

Question Paper

Security Analysis - I (211) : April 2007

Section A : Basic Concepts (30 Marks)

- This section consists of questions with serial number 1 - 30.
- Answer all questions.
- Each question carries one mark.
- Maximum time for answering Section A is 30 Minutes.

1. Which of the following statement(s) is/are **true** with respect to various types of debentures? [< Answer >](#)

- I. Unregistered debentures are freely negotiable and can be transferred by simple endorsement.
 - II. Public limited companies issuing debentures to the public are permitted to issue only unsecured debentures.
 - III. Only registered debentures are to be issued to public.
- (a) Only (I) above
 - (b) Only (II) above
 - (c) Only (III) above
 - (d) Both (I) and (III) above
 - (e) All (I), (II) and (III) above.

2. The beta of stock A is 2.0 and is currently in equilibrium. The required return on the stock is 12% and the expected return on the market is 10%. Suddenly due to changes in the economic conditions, the expected return on the market increases to 12%. Other things remaining the same what would be new required return on the stock? [< Answer >](#)

- (a) 15.0%
- (b) 16.0%
- (c) 18.5%
- (d) 20.0%
- (e) 22.0%.

3. Which of the following statement(s) is/are **true**? [< Answer >](#)

- I. For a characteristic line, the Y-axis represents the returns for a particular security and the X-axis represents the returns for the market index.
 - II. The SML line is same as the characteristic line for an individual security.
 - III. The slope of the SML is the beta for the particular security.
- (a) Only (I) above
 - (b) Only (II) above
 - (c) Only (III) above
 - (d) Both (I) and (II) above
 - (e) Both (II) and (III) above.

4. Which of the following is a purpose for the construction of stock indices? [< Answer >](#)

- (a) The growth in the primary market volumes can be measured through the movement of index
- (b) Indices help in finding the quantum of FII investments
- (c) Indices help in deciding on the allocation of resources between productive and non-productive lines of activities
- (d) The changes in share prices across the market can be estimated through the movement of indices
- (e) An index helps in finding the gain/loss from investment in a particular share.

5. Which of the following is **not** a required characteristic for a company to be included in S&P CNX 500?

[< Answer >](#)

- (a) It should have six month period of listing
- (b) Part of its share capital should be with public
- (c) It should have sufficient liquidity in quantity of shares traded and frequency with which public trading took place
- (d) It should have positive net worth for a period of three years
- (e) It should have market capitalization of Rs.500 crore.

6. Which of the following helps in the identification of a trend reversal before it occurs?

[< Answer >](#)

- (a) Trendlines
- (b) Simple moving average
- (c) Momentum
- (d) Exponential moving average
- (e) Price patterns.

7. Which of the following statement(s) is/are **true** with respect to Rectangles?

[< Answer >](#)

- I. It indicates equal pressure being exercised by buyers and sellers.
- II. It cannot predict the course of prices.
- III. Volume is usually low when the rectangle begins to form.

- (a) Only (I) above
- (b) Only (II) above
- (c) Only (III) above
- (d) Both (I) and (II) above
- (e) All (I), (II) and (III) above.

8. In structural analysis which of the following is considered as an exit barrier?

[< Answer >](#)

- (a) Capital requirement
- (b) Product differentiation
- (c) Economies of scale
- (d) Access to distribution channels
- (e) Strategic interrelationship.

9. Which of the following is **true** for companies that capitalize costs, instead of showing them as an expense?

[< Answer >](#)

- (a) Lower asset levels and lower equity levels
- (b) Higher asset levels and higher equity levels
- (c) Higher asset levels and lower equity levels
- (d) Lower asset levels and higher equity levels
- (e) Higher equity level and no change in asset level.

10. The required rate of return on a stock is 20%, and the retention ratio of the stock is constant at 70%. Currently the EPS on the stock is Rs.40 and the P/E ratio is 2.5, the growth rate in the earnings of the company is

[< Answer >](#)

- (a) 5.00%
- (b) 6.52%
- (c) 7.14%
- (d) 7.64%
- (e) 8.00%.

11. Constant-growth dividend discount model would be most suitable for valuing stocks of a

[< Answer >](#)

- (a) Company with valuable assets not yet generating profits
- (b) Moderate-growth, “mature” company
- (c) New firm which is expected to retain its earnings for several years
- (d) Fast growing company
- (e) Company with very less number of assets.

12. When prices are found to react after rallying up to a certain level and if the subsequent rallies also fail to rise above the previous highs, a level of resistance is found to be developing. Which of the following formation indicate the above given tendency?

[< Answer >](#)

- (a) Head and shoulders
- (b) Double Tops
- (c) Triangles
- (d) Saucers
- (e) Flags.

13. Which of the following statement is **not true** with respect to Rounding Tops?

[< Answer >](#)

- (a) It is an important reversal pattern
- (b) A rounding top indicate a slow change in the demand-supply balance
- (c) In this pattern the volume behaves opposite to the price pattern, resulting in low volume when the price is at the highest level
- (d) It is difficult to obtain support or resistance levels, or breakout levels for rounding tops
- (e) These patterns typically develop within a short span of time.

14. Following data pertains for the stock prices of Madhu Sugars Ltd. for a certain period of time:

[< Answer >](#)

Total number of runs (r) = 41

$$\mu_r = 51.84$$

$$\sigma = 5.95$$

At which of the following level of significance the stock price of the company is independent?

- I. Test at 5% level of significance.
- II. Test at 10% level of significance.
- III. Test at 20% level of significance.

- (a) Only (I) above
- (b) Only (II) above
- (c) Only (III) above
- (d) Both (I) and (II) above
- (e) Both (II) and (III) above.

15. Residual analysis is a test of

[< Answer >](#)

- (a) Weak form of market efficiency
- (b) Semi-strong form of market efficiency
- (c) Strong form of market efficiency
- (d) Super strong form of market efficiency
- (e) Random walk theory.

16. Which of the following statement is **false** with respect to various principles of bond price movements?

[< Answer >](#)

- (a) For a given change in a bond's yield to maturity, the percentage price change will be higher for low coupon bonds than for high coupon bonds
- (b) The increase in the price of the bond associated with the changes in the interest rates will be at a diminishing rate as the term to maturity increases
- (c) If the YTM increases above the coupon rate, then the market value drops below the face value
- (d) For a difference between the coupon and the YTM, the shorter the term to maturity of a bond, the greater will be the price changes
- (e) A change in the YTM affects the bonds with a higher YTM more than it affects the bonds with a lower YTM.

17. Consider a 10% bond of face value of Rs.1000 and redeemable after 5 years at a premium of 5%. The total interest on interest earned by the investor at the end of the second and the fifth year, at the reinvestment rate of 12 % are

[< Answer >](#)

- (a) Rs.10.00 and Rs.50.00 respectively
- (b) Rs.12.00 and Rs.135.28 respectively
- (c) Rs.24.00 and Rs.60.00 respectively
- (d) Rs.35.00 and Rs.125.50 respectively
- (e) Rs.50.00 and Rs.150.00 respectively.

18. Currently the share price of Minto Pharma Ltd. is Rs.55 per share and the dividend expected is Rs.4.50. The duration of this stock will be

[< Answer >](#)

- (a) 11.50 years
- (b) 12.22 years
- (c) 13.00 years
- (d) 20.55 years
- (e) 22.22 years.

19. Which of the following statement(s) is/are **true**?

[< Answer >](#)

- I. Convexity is used for measuring changes in bond price for both small and large changes in the required yield.
 - II. Coupon rate of a bond and convexity are inversely related.
 - III. Longer the maturity of a bond, smaller the convexity.
 - IV. Higher the duration of a bond, higher the convexity.
- (a) Only (I) above
 - (b) Only (III) above
 - (c) Both (I) and (II) above
 - (d) (I), (II) and (IV) above
 - (e) (II), (III) and (IV) above.

20. At the beginning of a trading day, Mr. Souvick is in a short position in the futures market and his collateral is exactly at the required margin. If the closing futures price is below the opening price, what will happen at the end of the day?

[< Answer >](#)

- (a) He will be subjected to a margin call
- (b) His account will be marked to market and losses will be transferred out
- (c) His losses will be carried forward to the next day
- (d) His losses will be offset by gains made by investors holding long positions
- (e) His account will be marked to market and gains will be transferred in.

21. A convertible bond with a face value of Rs.1,000 had been issued at Rs.1,300 with a coupon rate of 12%. The conversion rate is 20 shares per bond. The current market price of the bond is Rs.1,500 and that of stock is Rs.60. The premium over conversion value is

[< Answer >](#)

- (a) 8.33%
- (b) 20.00%
- (c) 25.00%
- (d) 30.00%
- (e) 41.67%.

22. The Holding-Period Return (HPR) for a stock is equal to

[< Answer >](#)

- (a) The real yield minus the inflation rate
- (b) The capital gains yield minus the tax rate
- (c) The dividend yield plus the capital gains yield
- (d) The nominal yield minus the real yield
- (e) The capital gains yield minus the dividend yield.

23. Which of the following statement(s) is/are **not true** with respect to “market extraction method” to derive the capitalization rate of real assets?

[< Answer >](#)

- I. In this method, net operating income is divided by sales price to get the capitalization rate.
- II. In this method, the rates on equity as well as debt financing rates are weighted according to their proportions to calculate the capitalization rate.
- III. In this method, the capitalization rate is the sum of the return required on an asset for its being non-liquid, and the risk free rate.
- IV. In this method, comparable properties are selected to choose a rate which reflects market sentiments.

- (a) Only (I) above
- (b) Only (II) above
- (c) Both (I) and (IV) above
- (d) Both (II) and (III) above
- (e) Both (III) and (IV) above.

24. Which of the following is **true**, if entry barriers are low and exit barriers are high in the industry?

[< Answer >](#)

- (a) Returns are low and risky
- (b) Returns are low and stable
- (c) Returns are high and stable
- (d) Returns are high and risky
- (e) Returns may vary depending on industry selected.

25. Which of the following is **not** usually conferred by mutual funds?

[< Answer >](#)

- (a) Diversified investment portfolio
- (b) Professional stock selection and asset management
- (c) Reduction in unsystematic risk
- (d) Tax benefits
- (e) Assured returns.

26. Consider the following data of J.M. Mutual Fund (Income plan):

[< Answer >](#)

Particulars	Rs. in crore
Value of investments	4169.04
Receivables	325.76
Accrued income	95.48
Other current assets	1146.46
Liabilities	977.12
Accrued expenses	225.84
Number of units outstanding	320 crore
Entry Load	2.5%

Mr. Prashant wants to purchase units of this scheme. The per unit price he will pay is

- (a) Rs.14.20
- (b) Rs.14.53
- (c) Rs.14.91
- (d) Rs.15.25
- (e) Rs.18.27.

27. Which of the following statement(s) is/are **true** with respect to OTCEI?

[< Answer >](#)

- I. It helps to reduce the delay in settlement.
- II. Scheduled banks and banking subsidiaries are not allowed to become members of OTCEI.
- III. It removes illiquidity by introducing new players namely compulsory market makers to help the small investors for sale of their securities.

- (a) Only (I) above
- (b) Only (II) above
- (c) Only (III) above
- (d) Both (I) and (III) above
- (e) All (I), (II) and (III) above.

28. Construction of a building is financed by issuing debt and equity in the ratio of 3:2. The debt consists of 10% bond having maturity period of 10 years. Interest will be compounded annually. The required rate of return on the equity is 20%. To redeem the bonds, a sinking fund is established. If, the net operating income from the property is expected to be Rs.350,000 infinitely, the market value of the property is

[< Answer >](#)

- (a) Rs.15,00,000
- (b) Rs.19,70,721
- (c) Rs.22,42,475
- (d) Rs.25,00,000
- (e) Rs.35,50,000.

29. Consider the following data :

[< Answer >](#)

Share	Base period Price (Rs.)	Current period Price (Rs.)
A	70	110
B	50	72
C	65	45
D	40	44

The base period index is 100. The current period index number based on geometric mean will be

- (a) 120.44
- (b) 126.67
- (c) 136.67
- (d) 150.33
- (e) 172.33.

[< Answer >](#)

30. The cash earning per share of Alok Industries Ltd. is Rs.15 and sales of the company is Rs.600 lakhs. The depreciation provided by the company is Rs. 30 lakhs. If the company has 10 lakhs shares outstanding, the net profit margin of the company is

- (a) 10.0%
- (b) 15.0%
- (c) 20.0%
- (d) 22.5%
- (e) 25.0%.

END OF SECTION A

Section B : Problems (50 Marks)

- This section consists of questions with serial number 1 – 5.
- Answer **all** questions.
- Marks are indicated against each question.
- Detailed workings should form part of your answer.
- Do not spend more than 110 - 120 minutes on Section B.

[< Answer >](#)

1 Consider the following data:

Company/Market	Beta	Variance (%) ²	Covariance with Sensex (%) ²
Excel Ltd.	N.A	1225	225
Delux Ltd.	1.30	1600	N.A
Sensex	1.0	400	400

Assuming that the assumptions of regression line holds good and the risk-free interest rate is 6.5% p.a., you are **required** to find:

- a.
 - i. Beta of Excel Ltd.
 - ii. Covariance of return on Delux Ltd. with that of return on sensex.
- b. The coefficient of correlation between:
 - i. Return on Excel Ltd. and the return on sensex.
 - ii. Return on Delux Ltd. and the return on sensex.
- c. The variance of portfolio formed using Excel Ltd. and Delux Ltd. in the proportion of $\frac{3}{4}$ and $\frac{1}{4}$ respectively.
- d. Whether the unsystematic risk of the portfolio is less than individual companies?

(2 + 2 + 3 + 3 = 10 marks)

[< Answer >](#)

2 Data for 15-trading days for Group B1 scrips of BSE is given below:

Day	Advances	Declines	Total no. of issues traded
1	199	451	661
2	77	581	664
3	28	634	665
4	473	187	664
5	598	63	665
6	398	236	648
7	296	341	647
8	167	465	648
9	249	386	649
10	342	300	649
11	375	255	652
12	426	212	652
13	316	330	653
14	264	374	653
15	331	322	666

You are **required** to calculate:

- Short-period A-D line
- Long-period A-D line.

(4 + 6 = 10 marks)

[< Answer >](#)

- 3 On, January 30, 2007 Vishal Industries Ltd. has come out with an issue of a Partly Convertible Debentures (PCDs) to part finance its Rs.40 crore capacity expansion program. As per the terms of this issue, 14% PCDs of Rs.200 each will be issued at par. The convertible part of the debenture (Part-A) of Rs.100 will be converted into 2 equity shares of face value of Rs.10 at a premium of Rs.40 each after 30 months from the date of allotment. The non-convertible portion (Part-B) of Rs.100 will be redeemed after 7 years. Interest will be paid semi-annually.

The following additional information and projections are available about the company:

Year (Ending)	March,2006	March,2007	March,2008	March,2009
EPS (Rs.)	4.00	4.90	6.20	8.21
Bonus	—	2:5	—	—

Month (2009)	January	February	March	April	May	June	July	August
Average P/E Ratio (Expected)	10.25	10.45	10.10	10.55	11.65	12.00	11.50	11.20

Rakesh, an investor is planning to subscribe to the issue to deploy his cash surplus. His required rate of return is 18% per annum compounded semi-annually.

You are **required** to advice Mr. Rakesh whether he should subscribe this issue or not.

(For the purpose of calculation of P/E, the average of the ratio for 6 months prior to the conversion date shall apply.)

(10 marks)

[< Answer >](#)

- 4 Mr. Manish, an analyst, is very much concerned about the continuous movement of the interest rates. One of his clients, Mr. Amish would like to put a fixed part of his investible funds in fixed income securities. Hence, Mr. Manish is currently analyzing two recently issued bonds, the details of which are as follows:

Particulars	Bond A	Bond B
Maturity	5 years	5 years
Coupon	9.50% p.a.	10% p.a.
Feature	Non-Callable	Callable
Call date	—	3 years from the date of issue
Issue price	Rs.950	Rs.1000
Face value	Rs.1000	Rs.1000
Periodicity of interest payment	Annual	Semiannual
Call price	—	Rs.1100

You are **required** to calculate

- The effect on the price of Bond A for a 50 basis points decrease in the market interest rates.
- Duration to call of bond B.

(6 + 4 = 10 marks)

[< Answer >](#)

- 5 ABC Ltd. is a major player in the textile industry of the country. The industry is expected to maintain high growth for a period of 5 years after which it is expected to drop down. Currently the company is

distributing 40% of its profit as dividend to shareholders. The dividend payout ratio of the company is expected to remain at the current level for a period of next 5 years after which it is expected to increase to 55%. The net profit margin of the company is currently 8% and is expected to remain at the same level for next 5 years, after which it is expected to decrease to 5.7%. Currently the company is able to generate sales of Rs.2.50 for every 1 rupee of assets employed and it is expected to remain the same for the next 5 years, and after that the company is expected to generate sales of Rs.3.50 for every 1 rupee of assets employed. 50% of the assets of the company are financed with equity capital, and it is expected to remain same in the future. At present the risk-free rate of return is 7% and market risk premium is 15.5%. The beta of the company is currently 1.2. Current net worth of the company is Rs.250 lakhs and numbers of shares outstanding is 2 lakhs.

Assuming that the market is in equilibrium, you are **required** to compute:

- a. Price per share of the company using Dividend Discount Model (DDM).
- b. Price to book value ratio of the share of the company.

(8 + 2 = 10 marks)

END OF SECTION B

Section C : Applied Theory (20 Marks)

- This section consists of questions with serial number 6 - 7.
- Answer **all** questions.
- Marks are indicated against each question.
- Do not spend more than 25 -30 minutes on section C.

- 6 The reflection of true value of an asset in its price is an indicator to the existence of an efficient market. Discuss some of the salient features of an efficient market. [< Answer >](#)

(10 marks)

- 7 Many industry analysts believe that industries evolve through four stages of complete life cycle. Infact, the concept of an industry life cycle can be applied to industries or product line within industries. Describe briefly the four stages of industry life cycle. [< Answer >](#)

(10 marks)

END OF SECTION C

END OF QUESTION PAPER

Suggested Answers

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Section A : Basic Concepts

1. Answer : (d) [<TOP>](#)
Reason: Based on security dimension, debentures can be classified as unsecured (or straight) debentures and secured (or mortgage) debentures. The public limited companies issuing debentures to the public are permitted to issue only secured debentures. Hence, statement (II) is false. All other statements are correct. Therefore, option (d) is the correct answer.
2. Answer : (b) [<TOP>](#)
Reason: $12 = R_f + 2 (10 - R_f)$
i.e., $R_f = 20 - 12 = 8\%$
Revised $R = 8 + 2 (12 - 8) = 16\%$.
3. Answer : (a) [<TOP>](#)
Reason: The SML line is not same as the characteristic line for an individual security. The slope of the characteristic line is the beta for the particular security involved. Therefore, option (a) is the correct answer.
4. Answer : (d) [<TOP>](#)
Reason: Market indices are designed to serve as indicators of broad movements in the securities market and as a sensitive barometer to the changes in trading pattern in the market.
5. Answer : (e) [<TOP>](#)
Reason: Statement (e) is the characteristic required to be fulfilled by a company in order to be included in S&P CNX 50 and not in S&P CNX 500. Hence, option (e) is the correct answer.
6. Answer : (c) [<TOP>](#)
Reason: A trend reversal with the help of trendlines, moving averages and price patterns can be identified only sometimes after the reversal has actually taken place. The concept of momentum is used to overcome this weakness in technical analysis by identifying a reversal much before a trend peaks or bottoms out. Momentum measures the rate at which prices rise or fall and is based on the principle that prices usually rise at the fastest pace well ahead of their peak, and decline at their greatest speed before their trough.
7. Answer : (d) [<TOP>](#)
Reason: Volume is usually high when the rectangle begins to form. Other two statements are correct with respect to rectangles. Therefore, Option (d) is the correct answer.

8. Answer : (e) [<TOP>](#)

Reason: Strategic interrelationship operates as exit barriers. Interrelationship between the business unit and others in the company in terms of image, marketing ability, access to financial markets, shared facilities and so on. They cause the firm to attach high strategic importance to being in the business. Product differentiation, capital requirements, economies of scale and access to distribution channels are major sources of entry barrier.

9. Answer : (b) [<TOP>](#)

Reason: By capitalizing costs, the expenditures become assets and they are written off over time rather than in the current period. Hence assets will be higher and net income will be higher resulting in higher equity.
Therefore, Option (b) is the correct answer.

10. Answer : (c) [<TOP>](#)

Reason: $EPS_0 = Rs.40$ and $P/E \text{ ratio} = 2.5$. Therefore, $MPS_0 = Rs.40 \times 2.5 = Rs.100$

$$P_0 = \frac{E_0 (1 - R.R.) (1 + g)}{k_e - g}$$
$$100 = \frac{40 (1 - 0.70) (1 + g)}{0.20 - g}$$
$$20 - 100g = 12 + 12g$$
$$8 = 112g$$
$$g = 7.14\%$$

11. Answer : (b) [<TOP>](#)

Reason: Constant-growth dividend discount model will be most suitable to value the stock of a firm which is expected to maintain balanced dividend per share. Moderate growth maturity company can provide such dividend and hence most suitable for this model.

12. Answer : (b) [<TOP>](#)

Reason: Double top is the formation which shows such a tendency.
Therefore, Option (b) is the correct answer.

13. Answer : (e) [<TOP>](#)

Reason: These patterns typically develop slowly and over a long span of time. Other options are correct with respect to rounding tops.
Therefore, Option (e) is the correct answer.

14. Answer : (a)

[<TOP>](#)

Reason: Test at 5% significance level :

$$\begin{aligned}\text{Lower limit} &= \mu_r - Z \sigma = 51.84 - 1.96 (5.95) = 40.18 \\ &= 51.84 + 1.96 (5.95) = 63.50\end{aligned}$$

Test at 10% significance level :

$$\begin{aligned}\text{Lower limit} &= \mu_r - Z \sigma = 51.84 - 1.65 (5.95) = 42.02 \\ &= 51.84 + 1.65 (5.95) = 61.66\end{aligned}$$

Test at 20% significance level :

$$\begin{aligned}\text{Lower limit} &= \mu_r - Z \sigma = 51.84 - 1.28 (5.95) = 44.22 \\ &= 51.84 + 1.28 (5.95) = 59.46\end{aligned}$$

Since at 5% significance level the observed number (r) of 41 falls within the lower and upper limits, the prices are independent.

Therefore, Option (a) is the correct answer.

15. Answer : (b)

[<TOP>](#)

Reason: Residual analysis is a test of semi-strong form of market efficiency. Since we happen to use the error or the residual term to calculate the abnormal returns, this analysis is referred to as residual analysis. For the market to be efficient in the semi-strong form, the sum of the residual returns should be close to zero.

Hence, option (b) is the correct answer.

16. Answer : (d)

[<TOP>](#)

Reason: For a difference between the coupon and the YTM, the extent of changes in the price of the bond depends on the remaining term to maturity. The larger the period, the greater will be the price changes. Hence, statement (d) is false. All other statements are correct.

Hence, option (d) is the correct answer.

17. Answer : (b)

[<TOP>](#)

Reason: For second year: interest on interest = $100 \times FVIFA_{(12,2)} - (100 \times 2) = \text{Rs.}12$

For the fifth year = $100 \times FVIFA_{(12,5)} - (100 \times 5) = \text{Rs.}135.28$.

18. Answer : (b)

[<TOP>](#)

Reason: Duration = $1/\text{Dividend yield} = 1/(4.5/55) = 12.22$ years.

19. Answer : (d)

[<TOP>](#)

Reason: Convexity is used for capturing the changes in prices for both large and small changes in the required yield.

Relationship between the convexity, coupon, maturity and yield of a bond:

the coupon of a bond and convexity (when coupon and maturity are constant) are inversely related.

The maturity of a bond and convexity (when yield and coupon are constant) are directly related.

The yield of a bond and convexity (when coupon and maturity are constant) are inversely related.

The determinants of the duration and convexity for option-free bonds are similar and the direction of impact is also similar. Therefore, higher the duration of the bond, higher the convexity.

Hence statement (III) is not true and statements (I), (II) and (IV) are true. Hence (d) is the answer.

20. Answer : (e)

[<TOP>](#)

Reason: In the situation, given your short position you have profited from the price decrease.

Therefore, Option (e) is the correct answer.

21. Answer : (c)

[<TOP>](#)

Reason:
$$\frac{\text{Premium over conversion value}}{\text{Bond price-Conversion value}} = \frac{\text{Conversion value}}{\text{Conversion value}}$$

Where conversion value = Current market price of the stock $\times$ Conversion rate

In the given case, conversion value = $60 \times 20 = \text{Rs.1,200}$

Premium over conversion value = $\frac{1500-1200}{1200} = 25\%$.

22. Answer : (c)

[<TOP>](#)

Reason: Holding period return is given by

$$\frac{D + (P_E - P_B)}{P_B} \quad \text{Where}$$

$$\frac{D}{P_B} + \frac{(P_E - P_B)}{P_B}$$

Dividend Yield Capital gains Yield

D = Dividend declared

P_B = Price of the share at the year beginning

P_E = Price of the share at the year ending.

Hence, HPR = Dividend yield + Capital gains yield.

23. Answer : (d)

[<TOP>](#)

Reason: Statement II relates to Band of Investment method. Statement III relates to Built-up method.

24. Answer : (a)

[<TOP>](#)

Reason:

Entry barriers	Exit barriers		
		Low	High
	Low	Low, stable returns	Low, risky returns
	High	High, stable returns	High, risky returns

Therefore, Option (a) is the correct answer.

25. Answer : (e)

[<TOP>](#)

Reason: Mutual funds do not guarantee any assured returns.
Hence, option (e) is the correct answer.

26. Answer : (b)

[<TOP>](#)

$$\begin{aligned}\text{Reason: Public offering price} &= \frac{\text{NAV}}{1 - \text{Sales charge}} \\ &= \\ &= \frac{(4169.04 + 325.76 + 95.48 + 1146.46 - 977.12 - 225.84) / 320}{(1 - 0.025)} \\ &= \frac{14.168}{0.975} = \text{Rs.14.53}.\end{aligned}$$

27. Answer : (d)

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Reason: All scheduled banks and banking subsidiaries can become members of OTCEI. Hence, statement (II) is false. All other statements are correct.

Hence, option (d) is the correct answer.

28. Answer : (b)

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Reason: The total payments required to be made to the bondholders consists of interest payments and contribution to the sinking fund.

$$\text{Amount contributed to the sinking fund} = \frac{i}{(1+i)^n - 1} = \frac{0.10}{(1+0.10)^{10} - 1} = 0.0627$$

Interest rate on the bonds = 0.10

Therefore, total payments for a bond = 0.10 + 0.0627 = 0.1627 = 16.27%.

Therefore, capitalization rate for the property = (0.60 x 0.1627) + (0.40 x 0.20) = 17.76%.

Market value of the property = 350000/0.1776 = Rs.1970720.721 = Rs.19,70,721

29. Answer : (e)

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Reason: The geometric mean will be

$$\left(\frac{110}{70} \times \frac{72}{50} \times \frac{45}{65} \times \frac{44}{40} \right) \times 100 = 172.33$$

Therefore, Option (e) is the correct answer.

30. Answer : (c)

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$$\text{Reason : Cash earning per share} = \frac{\text{PAT} + \text{Depreciation}}{\text{No. of shares}}$$

$$15 = \frac{\text{PAT} + 30 \text{ lakhs}}{10 \text{ lakhs}}$$

Therefore, PAT = 120 lakhs.

Net Profit margin = PAT/Sales = 120/600 = 20%

Therefore, Option (c) is the correct answer.

Section B : Problems

$$\begin{aligned} 1. \quad a. \quad i. \quad \text{Beta of Excel Ltd.} &= \frac{\text{Cov}_{(\text{Excel}, M)}}{\text{Var}_{(M)}} \\ &= \frac{0.0225}{0.0400} \\ &= 0.5625 = 0.56 \end{aligned}$$

$$\begin{aligned} ii. \quad \text{Cov}(\text{Delux}, M)(\%)^2 &= \beta_{\text{Delux}} \times \text{Var}(M) \\ &= 1.30 \times 0.0400 \\ &= 0.052 = 520(\%)^2 \end{aligned}$$

$$\begin{aligned} b. \quad i. \quad \rho_{\text{excel}, M} &= \frac{\text{Cov}_{(\text{Excel}, M)}}{\sigma_{\text{Excel}} \times \sigma_M} \end{aligned}$$

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$$\frac{0.0225}{0.35 \times 0.20} = 0.32$$

$$\text{ii. } \rho_{\text{Delux},M} = \frac{\text{Cov}_{(\text{Delux},M)}}{\sigma_{\text{Delux}} \times \sigma_M}$$

$$\frac{0.0520}{0.40 \times 0.20} = 0.65 = 0.65$$

$$\text{c. Variance of the portfolio} = W_E^2 \sigma_E^2 + W_D^2 \sigma_D^2 + 2W_E W_D \text{Cov}(E, D)$$

$$W_{\text{Excel}} = \frac{3}{4} = 0.75$$

$$W_{\text{Delux}} = \frac{1}{4} = 0.25$$

From, the assumptions of characteristic line, we get

$$\begin{aligned} \text{Cov}_{(\text{Excel}, \text{Delux})} &= \beta_{\text{Excel}} \times \beta_{\text{Delux}} \times \text{Var}(M) \\ &= 0.56 \times 1.30 \times 0.0400 = 0.02912 \\ &= 291.2(\%)^2 \end{aligned}$$

Variance of the portfolio =

$$\begin{aligned} &(0.75)^2 \times (0.35)^2 + (0.25)^2 \times (0.40)^2 + 2 \times 0.75 \times 0.25 \times 0.02912 \\ &0.089826 = 898.26(\%)^2 \end{aligned}$$

$$\begin{aligned} \text{d. Unsystematic risk of the Excel Ltd.} &= (1 - \rho_{\text{Excel},M}^2) \sigma_{\text{Excel}}^2 \\ &= (1 - 0.32^2) 0.1225 \\ &= 0.109956 = 1099.56(\%)^2 \end{aligned}$$

$$\begin{aligned} \text{Unsystematic risk of the Delux Ltd.} &= (1 - \rho_{\text{Delux},M}^2) \sigma_{\text{Delux}}^2 \\ &= (1 - 0.65^2) 0.1600 \\ &= 0.0924 = 924.00(\%)^2 \end{aligned}$$

$$\begin{aligned} \text{Beta of the portfolio} &= W_E \beta_E + W_D \beta_D \\ &= (0.75 \times 0.56) + (0.25 \times 1.30) \\ &= 0.745 \end{aligned}$$

$$\rho_{\text{Port},M} = \frac{\text{Cov}_{(\text{Port},M)}}{\sigma_{\text{Port}} \times \sigma_M}$$

$$= \beta_{\text{Port}} \times \sigma_{\text{Port}}$$

$$\begin{aligned} &= 0.745 \times \frac{0.20}{\sqrt{0.089826}} \\ &= 0.497 = 0.50 \end{aligned}$$

$$\begin{aligned} \text{Unsystematic risk of the portfolio} &= (1 - \rho_{\text{Port},M}^2) \sigma_{\text{Port}}^2 \\ &= (1 - 0.50^2) 0.089826 \end{aligned}$$

$$= 0.067370$$

$$= 673.70(\%)^2$$

Therefore, we find that the unsystematic risk of the portfolio is less than that of individual stocks. From the results it can be implied that because of constitution of portfolio unsystematic risk reduces.

2. a. Short-period A-D line:

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For short-period observations A-D lines do not account for unchanged stocks:

Day	Issues traded	Advances	Declines	Net (A-D)	Cumulative (A-D)
1	661	199	451	-252	-252
2	664	77	581	-504	-756
3	665	28	634	-606	-1362
4	664	473	187	286	-1076
5	665	598	63	535	-541
6	648	398	236	162	-379
7	647	296	341	-45	-424
8	648	167	465	-298	-722
9	649	249	386	-137	-859
10	649	342	300	42	-817
11	652	375	255	120	-697
12	652	426	212	214	-483
13	653	316	330	-14	-497
14	653	264	374	-110	-607
15	666	331	322	9	-598

b. Long-period A-D line:

For long period observations, the A-D line is drawn after considering those stocks also whose price remain unaltered. The A-D line is drawn by accumulating the value of $\sqrt{A/U-D/U}$.

Days	Issues traded (1)	Adv - ances (2)	Declines (3)	Un - changed (4)	(2)/(4) x 100 (5)	(3)/(4) x 100 (6)	(5)-(6) (7)	$\sqrt{(5)-(6)}$ (8)	Cumulativ e (A - D) (9)
1	661	199	451	11	1809.09	4100.00	-2290.91	-47.86	-47.86
2	664	77	581	6	1283.33	9683.33	-8400.00	-91.65	-139.51
3	665	28	634	3	933.33	21133.33	-20200.00	-142.13	-281.64
4	664	473	187	4	11825.00	4675.00	7150.00	84.56	-197.08
5	665	598	63	4	14950.00	1575.00	13375.00	115.65	-81.43
6	648	398	236	14	2842.86	1685.71	1157.14	34.02	-47.41
7	647	296	341	10	2960.00	3410.00	-450.00	-21.21	-68.63
8	648	167	465	16	1043.75	2906.25	-1862.50	-43.16	-111.78
9	649	249	386	14	1778.57	2757.14	-978.57	-31.28	-143.07
10	649	342	300	7	4885.71	4285.71	600.00	24.49	-118.57
11	652	375	255	22	1704.55	1159.09	545.45	23.35	-95.22
12	652	426	212	14	3042.86	1514.29	1528.57	39.10	-56.12
13	653	316	330	7	4514.29	4714.29	-200.00	-14.14	-70.26
14	653	264	374	15	1760.00	2493.33	-733.33	-27.08	-97.34
15	666	331	322	13	2546.15	2476.92	69.23	8.32	-89.02

3. The intrinsic value of the above PCD is calculated as under:

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a. Present value of interest payments

$$= 14 \times \text{PVIFA}(9\%,5) + 7 \times \text{PVIFA}(9\%,9) \times \text{PVIF}(9\%,5)$$

$$= (14 \times 3.8897) + (7 \times 5.9952 \times 0.6499)$$

$$= \text{Rs.} 81.73$$

b. Bonus adjusted EPS

Year (ending)	March	March	March	March
	2006	2007	2008	2009
EPS	4.00	6.86	8.68	11.49

Growth rate (g) implicit in the bonus adjusted EPS can be obtained from the following equation:

$$4(1+g)^3 = 11.49$$

$$g = \left(\frac{11.49}{4.00} \right)^{\frac{1}{3}} - 1 = 0.4217 = 42.17\%$$

$$\text{Projected EPS in July, 2009} = 11.49 \left(1 + \frac{0.4217}{3} \right) = \text{Rs.} 13.11$$

Average P/E ratio between February 2009 to July 2009 (6 months prior to the conversion)

$$\frac{10.45 + 10.10 + 10.55 + 11.65 + 12.00 + 10.50}{6} = 11.04$$

$$\text{Expected market price per share after 30 months i.e. on July 2009} = 11.04 \times 13.11$$

$$= \text{Rs.} 144.73$$

$$\text{Present value of market value of conversion after 30 months} = 144.73 \times 2 \times \text{PVIF}(9\%, 5)$$

$$= 144.73 \times 2 \times 0.6499$$

$$= \text{Rs.} 188.13$$

c. PV of non-convertible portion after 7 years = 100 x PVIF(9%, 14)

$$= 100 \times 0.2992$$

$$= \text{Rs.} 29.92$$

d. Intrinsic value of the PCD = A + B + C

$$= 81.73 + 188.13 + 29.92$$

$$= \text{Rs.} 299.78$$

Therefore, Mr. Rakesh should invest in the PCDs as the intrinsic worth of PCD is more than the issue price.

4. a. YTM for Bond

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$$950 = 95 \times \text{PVIFA}(K\%, 5) + 1000 \times \text{PVIF}(K\%, 5)$$

At the rate of 10% R.H.S = 981.03

At the rate of 12% R.H.S = 909.86

By doing interpolation YTM = 10.87% p.a.

Duration of Bond A

Period	CF	PVIF@10.87%	PV(CF)	n × PV(CF)
1	95	0.902	85.69	85.69
2	95	0.813	77.24	154.48
3	95	0.734	69.73	209.19
4	95	0.662	62.89	251.56
5	1095	0.597	653.72	3268.6
			949.27	3969.52

$$\text{Duration} = \frac{3969.52}{949.27} = 4.18 \text{ years.}$$

MD of Bond A

$$MD = \frac{D}{1 + 0.1087} = \frac{4.18}{1.1087} = 3.77$$

$$\% \text{ Price Change} = \frac{-50}{100} \times 100 = -50\% \text{ (decrease)}$$

b. Yield to call for Bond B

$$1000 = 50 \times PVIFA(K\%, 6) + 1100 \times PVIF(K\%, 6)$$

At the rate of 6% R.H.S. = 1021.37

7% R.H.S. = 971.26

By, doing interpolation, YTM = 6.43% half yearly

Duration to call for Bond B

Period	CF	PV@6.43%	PVCF	PV × n
1	50	0.940	47	47
2	50	0.883	44.15	88.30
3	50	0.829	41.45	124.35
4	50	0.779	38.95	155.80
5	50	0.732	36.60	183.00
6	1150	0.688	791.20	4747.20
			999.35	5345.65

$$\text{Duration to call} = \frac{5345.65}{999.35} = 5.35 \text{ half yearly period. i.e 2.67 years.}$$

5. a.

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Particulars	Next 5 years	After 5 years
Pay-out ratio	40%	55%
Net profit margin (a)	8%	5.7%
Asset turn over ratio (b)	2.50	3.50
NW/TA (c)	50%	50%
ROE = (a x b) / (c)	40%	39.9% = 40%
Growth rate (6) = (1- Payout ratio) x ROE	24%	18%

Calculation of price per share:

Year	Growth rate	DPR	EPS	DPS
0	24	40	50	
1	24	40	62	24.8
2	24	40	76.88	30.752
3	24	40	95.33	38.132
4	24	40	118.21	47.284
5	24	40	146.58	58.632
6	18	55	172.97	95.134

Calculation of Current EPS of the company:

$$ROE = PAT/NW$$

$$0.40 = PAT/250 \text{ lakhs}$$

$$PAT = 0.40 \times 250 \text{ lakhs}$$

$$PAT = \text{Rs.} 100 \text{ lakhs}$$

$$EPS = PAT/\text{No. of shares outstanding}$$

$$= 100 / 2$$

$$= \text{Rs. } 50$$

$$\begin{aligned}\text{Calculation of Cost of equity} = K_e &= R_f + \beta (R_m - R_f) \\ &= 7 + 1.2 (15.5) \\ &= 25.6\%\end{aligned}$$

$$\text{Terminal value at the end of 5}^{\text{th}} \text{ year} = 95.134 / (0.256 - 0.18) = 1251.76$$

Value of share at time '0' =

$$\frac{24.8}{1.256} + \frac{30.752}{1.256^2} + \frac{38.132}{1.256^3} + \frac{47.284}{1.256^4} + \frac{58.632 + 1251.76}{1.256^5}$$

$$= \text{Rs. } 496.71$$

$$\begin{aligned}\text{b. Book value per share of ABC Ltd.} &= \frac{\text{Net worth}}{\text{No. of shares outstanding}} \\ &= \frac{250}{2} = \text{Rs. } 125\end{aligned}$$

$$\text{Therefore, price to book value ratio} = 496.71 / 125 = 3.97$$

Section C: Applied Theory

6. The following are some of the other salient features of an efficient market:

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1. **Breadth:** By breadth we understand that there are a large number of rational participants with homogenous expectations in the market. The decision taken by any of these participants will not affect the market in a significant manner.
2. **Depth:** A market is said to have depth when the volume of securities traded (number of transactions) is very large. This ensures that an investor can enter and exit according to his preference and convenience.
3. **Information arbitrage efficiency** is said to exist if the participants do not have any scope to reap abnormal profits using information which is of common knowledge.
4. **Fundamental valuation efficiency** is said to exist if the price of an asset is equal to its intrinsic value. That is, the asset is neither overvalued nor undervalued.
5. **Full insurance efficiency** is said to exist, if participants can adopt hedging as an effective tool against possible risks in future.
6. **Operational efficiency** is said to exist, if the operating costs (administrative and transaction costs) are minimum possible to the participants, but still provide a fair return to the intermediaries for their services.
7. **Allocational efficiency** is said to exist, if the market channelizes resources into projects where the marginal efficiency of capital adjusted for risk differences is the highest. It means that funds flow to such investment opportunities where the returns, risk adjusted basis are highest.

Under these ideal conditions, the markets attain the equilibrium position. That is, the demand for assets matches (equals) their supply.

7. Many observers believe that industries evolve through four stages – the pioneering stage, the expansion stage, the stabilization stage and the declining stage. There is an obvious parallel in this idea to human development. The concept of an industry life cycle could apply to industries or product lines within industries. The industry life cycle concept is depicted in figure 6.2 and each stage is discussed in the following section.

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Pioneering Stage

In this stage, rapid growth in demand occurs. Although a number of companies within a growing industry will fail at this stage because they will not survive the competitive pressures, most experience rapid growth in sales and earnings, possibly at an increasing rate. The opportunities available may attract a number of companies, as well as venture capital. Considerable jockeying for position occurs as the companies battle each other for survival, with the weaker firms failing and dropping out. Investor risk in an unproven company is high, but so are expected returns if the company succeeds. At the pioneering stage of an industry it can be difficult for security analysts to identify the

likely survivors, just when the ability to identify the future strong performers is most valuable. By the time it becomes apparent who the real winners are, their prices may have been bid up considerably beyond what they were in the earlier stages of development.

Expansion Stage

In this second stage of an industry's life cycle the survivors from the pioneering stage are identifiable. They continue to grow and prosper, but the rate of growth is more moderate than before. At the expansion stage of the cycle, industries are improving their product and perhaps lowering their prices. They are more stable and solid, and at this stage they often attract considerable investment funds. Investors are more willing to invest in these industries now that their potential has been demonstrated and the risk of failure has decreased.

"Financial policies become firmly established at this stage. The capital base is widened and strengthened dividends often become payable, further enhancing the attractiveness of these companies to a number of investors.

Stabilization Stage

Finally, industries evolve into the stabilization stage (sometimes referred to as the maturity stage), at which the growth begins to moderate. Sales may still be increasing, but at a much slower rate than before. Products become more standardized and less innovative, the market place is full of competitors, and costs are stable rather than decreasing through efficiency moves and so on. Industries at this stage continue to move along, but without significant growth.

Stagnation may occur for considerable periods of time, or intermittently.

This three-part classification of industry evolution is helpful to investors in assessing the growth potential of different companies in an industry. Based on the stage of the industry, they can better assess the potential of companies within that industry. However, there are limitations to this type of analysis. First, it is only a generalization, and investors must be careful not to attempt to categorize every industry, or all companies within a particular industry, into neat categories that may not apply. Second, even the general framework may not apply to some industries that are not categorized by many small companies struggling for survival. Finally, the bottom line in security analysis is stock prices, a function of the expected stream of the benefits and risk involved. The industrial life cycle tends to focus on sales and share of the market and investment in the industry. Although all of these factors are important to investor, they are not the final items of interest. Given these qualifications to industry life cycle analysis, what are the implications to investors?

The pioneering stage may offer the highest potential returns, but also offers the greatest risk. Several companies in a particular industry will fail, or do poorly. Such risk may be appropriate for some investors, but many will wish to avoid the risk inherent in this stage.

The maturity stage is to be avoided by investors interested primarily in capital gains. Companies at this stage may have relatively high dividend pay-outs because their growth prospects are fewer. These companies often offer stability in earnings and dividend growth.

Declining Stage

In this stage of the industrial life cycle – decline is indicated on either a relative or absolute basis. Clearly, investors should seek to spot industries in this stage and avoid them.

It is the second stage i.e. expansion, that is probably of most interest to investors. Industries that have survived the pioneering stage often offer good opportunities as the demand for their products and services is growing more rapidly than the economy as a whole. Growth is rapid, but orderly, an appealing characteristic to investors.

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