

Question Paper

Security Analysis - I (211) : October 2006

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. Mr. Raman is considering a portfolio-Alpha that consists of two securities Ranbaxy (R_A) and Pfizer (P_F) with 40% investment in Ranbaxy and the rest in Pfizer. The characteristics of returns of the two securities are as follows:

[< Answer >](#)

Probability	Return on Ranbaxy (R_A)(%)	Return on Pfizer (P_F)(%)
0.35	65	78
0.65	32	26

The standard deviation of portfolio Alpha is

- (a) 6.45%
 - (b) 15.06%
 - (c) 21.17%
 - (d) 32.55%
 - (e) 41.19%.
2. Which of the following is/are the application of ex-ante SML?
- I. Test of asset pricing theories.
 - II. Test of market efficiency.
 - III. Evaluating the performance of a portfolio manager.
 - IV. Identifying undervalued securities.
- (a) Only (IV) above
 - (b) Both (II) and (III) above
 - (c) Both (II) and (IV) above
 - (d) (I), (II) and (III) above
 - (e) (II), (III) and (IV) above.
3. Allocation efficiency is said to exist if

[< Answer >](#)

[< Answer >](#)

- I. The operating costs are minimum possible to the participants, but still provide a full return to the intermediaries for their services.
 - II. The participants do not have any scope to reap abnormal profits using information, which is of common knowledge.
 - III. If the market channelizes resources into projects where the marginal efficiency of capital adjusted for risk differences is the highest.
- (a) Only (I) above
 - (b) Only (III) above
 - (c) Both (I) and (III) above
 - (d) Both (II) and (III) above
 - (e) All (I), (II) and (III) above.

4. The major source of exit barriers are

[< Answer >](#)

- I. Specialized assets.
- II Emotional barriers.
- III. Strategic relationships.

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

5. Myur Ltd. has profit before tax at Rs.250.50 lacs. The company purchased an asset worth Rs.45.50 lacs. Depreciation is provided on straight-line basis at a rate of 12% p. a. The company has equity share capital of Rs.750.00 lacs at Rs.10 each. If the corporate tax rate applicable is 35%, the cash earnings per share (CEPS) is

[< Answer >](#)

- (a) Rs.1.52
- (b) Rs.2.24
- (c) Rs.3.56
- (d) Rs.4.58
- (e) Rs.7.85.

6. In which of the following situations, the company profits are inflated?

[< Answer >](#)

- I. Switching from accrual basis to cash basis of accounting for gratuity.
- II. Switching from FIFO to LIFO method of inventory valuation during decreasing prices.
- III. Capitalizing the patent rights which were previously written-off.

- (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.

7. Consider the following data of Vinay Cosmetics Ltd.

[< Answer >](#)

Current year DPS	Rs.4.25
Required rate of return	13.5%
Perpetual stable growth rate	10%
Pay-out ratio	50%
Sales	Rs.240 lacs
No. of shares outstanding	1 lac

The net profit margin (NPM) based on expected earnings is

- (a) 1.15%
- (b) 1.18%
- (c) 2.46%
- (d) 3.54%
- (e) 3.87%.

8. ABC Ltd. issues right shares which increases the market value of the shares of the company by Rs.150 crore. The aggregate market value of all the shares included in the index before the right issue made is Rs.2500 crore. If, the Base year average for calculating the index number for a period starting from the time the right issue is made till the next base year change becomes necessary is Rs.1010 crore, what is the existing base year average?

[< Answer >](#)

- (a) Rs.1070.60 crore
- (b) Rs.1005.94 crore
- (c) Rs.952.83 crore
- (d) Rs.949.40 crore
- (e) Rs.823.23 crore.

9. Which of the following technique is used to identify the trend reversal before it takes place?

[< Answer >](#)

- (a) Volume of the market
- (b) Momentum
- (c) Simple moving average
- (d) Breadth of the market
- (e) Weighted moving average.

10. Which of the following is/are said to be **false** with respect to Stop Loss Price Order?

[< Answer >](#)

- I. It is an order that allows the price to be specified while entering the order into the system.
- II. It allows the trading member to place an order that gets activated only when the market price of the relevant security reaches a threshold limit.
- III. It is an order to buy or sell securities at the best price obtainable at the time of entering the order.

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

11. Alok Industries has return on equity of 12%, its profit margin is 6% and the asset turnover is 1.00. What is its proportion of debt as a percentage of total assets?

[< Answer >](#)

- (a) 0.25
- (b) 0.50
- (c) 1.00
- (d) 1.25
- (e) 2.00.

12. Consider the following particulars of Melanin Ltd.

[< Answer >](#)

Growth rate in first 4 years	16%
Growth rate after 4 years	10%
Required rate of return	12%
Pay-out ratio in the first 4 years	30%
Pay-out ratio after 4 years	48%

If the return on equity is 15%, Price/Book value ratio (P/BV) will be

- (a) 0.85
- (b) 1.25
- (c) 1.48
- (d) 1.45
- (e) 1.61.

13. Which of the following is/are considered as advantages of Price-sales ratio (P/S ratio)?

[< Answer >](#)

- I. P/S ratio is never influenced by accounting methods.
- II. P/S ratio is a useful tool to examine the benefits of changes in pricing policy and other corporate decisions.
- III. P/S ratio can never be negative unlike P/E and P/BV ratios.

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

14. Which of the following statements is/are **not true** with respect to Symmetrical Triangles?

[< Answer >](#)

- I. This is formed when, in a series of rallies, each succeeding one peaks at a lower level than the preceding peaks, and the bottoms of the intervening relations are progressively high.
- II. Volumes increase as the triangle narrows towards the apex.
- III. A triangle cannot be said to be in a continuation pattern or a reversal pattern before the breakout.

- (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.

15. Which of the following statement is **not true** with respect to rising and falling wedges?

[< Answer >](#)

- (a) Wedges are characterized by prices fluctuating between two converging boundary lines
- (b) In case of rising wedge, the boundary lines slope upward with the upper line being at a steeper angle than the lower line
- (c) Trading volume in a wedge diminishes as prices move towards the apex of the wedge
- (d) When prices break through the lower line of a rising wedge, they usually fall intensely
- (e) When prices break from the upper boundary of a falling wedge, they tend to move sideways for a certain period before they begin to rise.

16. The shares of Xavier Metals Ltd. are currently trading at Rs.560.45. During the month of August 2006 and September 2006 number of positive price changes in the stock are 21 while the number of negative price changes in the stock are 15. The standard error measured by the company is

[< Answer >](#)

- (a) 2.87
- (b) 3.22
- (c) 4.58
- (d) 5.96
- (e) 6.59.

17. Which of the following statement is a property of realized yield?

[< Answer >](#)

- (a) For bonds with longer term to maturity realized yield will be higher than the reinvestment rate
- (b) If the reinvestment rate is greater than realized yield the realized yield will be lesser than YTM
- (c) If the reinvestment rate is lesser than realized yield the realized yield will be greater than YTM
- (d) If the reinvestment rate is greater than realized yield the realized yield will be equal to YTM
- (e) For bonds with shorter term to maturity realized yield will be closer to the YTM.

18. IDBI came out with an issue of deep discount bonds. Each bond having a face value of Rs.125,000 was issued at a deep discounted price of Rs.480.50 with a maturity period of 15 years. The corporate tax rate applicable is 25%. If the indexed cost of acquisition is 25%, then the post-tax yield to maturity of the bond is

[< Answer >](#)

- (a) 42.47%
- (b) 35.21%
- (c) 29.67%
- (d) 11.58%
- (e) 5.37%.

19. Which of the following statements is **not true** with respect to various types of mutual funds?

[< Answer >](#)

- (a) In performance funds, the investment is made in buying equity shares of small unseasoned companies with relatively high price-earnings ratio and higher price volatility
- (b) In specialty funds, the investment is made in equity shares of good track record companies which offer long term capital growth and provide handsome dividend
- (c) Money market funds are high liquid funds with very low risk and virtually no capital loss
- (d) Real Estate funds is of open ended type
- (e) Close-ended Mutual fund units are issued like any other company's new issues listed and quoted at stock exchange.

20. Which of the following statements is/are **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 property is selected to choose a rate which reflects market sentiments.
- (a) Only (I) above
 - (b) Only (IV) above
 - (c) Both (I) and (IV) above
 - (d) Both (II) and (III) above
 - (e) (I), (II) and (IV) above.

21. The advantages of Cox, Ingersoll and Ross (CIR) model is/are

[< Answer >](#)

- I. Mean and variance of the factors return can be estimated directly by observing the time series of factors returns.
 - II. Because of continuously defined maturities in the model, exposure can be calculated for zero-coupon bonds of any maturity with recourse to approximation or interpolation.
 - III. It is inconsistent with the valuation of fixed income securities.
- (a) Only (I) above
 - (b) Only (II) above
 - (c) Both (I) and (III) above
 - (d) Both (II) and (III) above
 - (e) All (I), (II) and (III) above.

22. Which of the following would be true evidence against the semi-strong form of market efficient theory?

[< Answer >](#)

- (a) No investor can make superior profits by purchasing or selling stock after the announcement of unexpected rise in dividend
- (b) Trend analysis is worthless in determining stock prices
- (c) Positive abnormal returns can be expected from low P/E stocks
- (d) Mutual fund managers do not persistently make superior returns
- (e) Investors cannot make superior profits by changing his portfolio according to change in the interest rates.

23. The shares of Reliance Industries Ltd. are trading at Rs.370. Put options with a strike price of Rs.380 are priced at Rs.16. The intrinsic value and time value of the options respectively are [< Answer >](#)
- Rs.6, Rs.10
 - Rs.8, Rs.8
 - Rs.10, Rs.6
 - Rs.8, Rs.16
 - Rs.16, Rs.12.
24. Stock of Zenion Ltd. has conversion parity price of Rs.35.50. If the number of shares on conversion per warrant is 25, the bond price is [< Answer >](#)
- Rs.887.50
 - Rs.758.36
 - Rs.658.45
 - Rs.528.11
 - Rs.358.24.
25. Price of a non-callable bond is Rs.235.50, followed by the price of a callable bond at Rs.132.00. It is ascertained that the duration of the non-callable bond is 5 years. If the delta of the call option is 0.872, the option adjusted duration is [< Answer >](#)
- 1.265 years
 - 1.142 years
 - 1.876 years
 - 1.893 years
 - 1.674 years.
26. Which of the following statements is/are **false** for the duration of a bond? [< Answer >](#)
- For all bonds, which pay periodic coupons, duration is more than the term to maturity.
 - A bond's duration will be equal to its term to maturity if it is a zero-coupon bond.
 - As the maturity of the coupon-bearing bond is lengthened, duration also increases albeit at a faster rate.
- Only (I) above
 - Only (II) above
 - Both (I) and (III) above
 - Both (II) and (III) above
 - All (I), (II) and (III) above.
27. Which of the following statement(s) is/are **true** about the capital formation? [< Answer >](#)
- The amount of capital formation in the economy during a period is equal to the amount of investment that takes place in that economy during that period.
 - Fixed capital formation includes investments in Purchasing machinery, building and land.
 - If depreciation is excluded in the calculation of capital formation it is called Gross capital formation.
- Only (I) above
 - Only (II) above
 - Only (III) above
 - Both (I) and (II) above
 - All (I), (II) and (III) above.

28. Which of the following statement satisfies the characteristic of Econometric Model Building Approach?

[< Answer >](#)

- (a) This model can be meaningful for future projections if and only if the estimated co-efficient are found to be acceptable in respect of their stability over time
- (b) The model is data demanding and requires vast deal of judgment and ingenuity
- (c) The approach helps to measure how widespread the phenomenon is
- (d) It should move smoothly from one period to another as it rises or falls and should turn sharply at its peak and troughs
- (e) This model does not convey any information on the magnitude and direction of change.

29. Consider the following data about two securities A and B:

[< Answer >](#)

Particulars	Security A	Security B
Expected Return (%)	12	13
Standard deviation of returns (%)	21	29
Beta	1.10	1.20

Variance of returns on the market index is $400 (\%)^2$. The correlation coefficient between the returns on securities A and B is 0.94.

The systematic risk of a portfolio consisting of these two securities in equal proportions is

- (a) $24.63(\%)^2$
- (b) $460.00(\%)^2$
- (c) $529.00(\%)^2$
- (d) $606.73(\%)^2$
- (e) $802.40(\%)^2$.

30. Which of the following statement(s) is/are **false** about the principles of price patterns?

[< Answer >](#)

- I. The significance of a price pattern is a direct function of its size and depth.
 - II. The shorter it takes for prices to move out of the pattern, the stronger is the base of the new trend.
 - III. The validity of the breakout should be confirmed by volume statistics.
- (a) Only (I) above
 - (b) Only (II) above
 - (c) Only (III) above
 - (d) Both (I) and (II) above
 - (e) Both (I) and (III) above.

END OF SECTION A

Section B : Problems (50 Marks)

- This section consists of questions with serial number 1 – 6.
- 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.

1. ILFS Venture Fund is a leading venture capital fund. The fund invests in untested projects; it also provides mezzanine financing to the companies, which are planning public offering of their equity. The time horizon of all the investments made by this fund is one year.

[< Answer >](#)

The fund has received an investment proposal from Marco Ltd. The company is an existing profit making company involved in the non-conventional energy generation projects. The management of the company is at the opinion that this sector has a huge growth potential and has very good prospects for profit. Therefore they propose to increase its capacity by 40%. And they have furnished the fund requirement of Rs.65 crore to the finance department of the company.

Following are the information furnished by the finance department of the Marco Ltd. to ILFS Venture Fund:

The current EPS of the company is Rs.12

Growth rate in EPS (%)	Probability
Growth in EPS (%)	
0	0.13
15	0.22
25	0.32
30	0.10
40	0.23

P/E Ratio	Probability
13	0.35
16	0.20
20	0.30
23	0.15

The target return on any investment made by ILFS Venture Fund is 50%. The Fund has the policy to invest in any proposal only if the probability of achieving the target return is 65%.

You are **required** to find the price at which ILFS Venture Fund should invest in the Marco Ltd. (Clearly state your assumptions.)

(10 marks)

2. Scurvy Steel Ltd. has announced right issues of Partly Convertible Debenture (PCD's) to part finance its project of Rs.230 crores at Noida U.P. The market presently is covered with depressed interest rate, hence the company decided to issue each debenture of face value of Rs.1000 each at Rs.850 only. Annual coupon rate payable on this debenture is 9.50%.

[< Answer >](#)

The debenture consists of part A, B, and C. And the features for the same are as follows:

Part	
A	30% of the face value will be converted into one equity share on allotment.
B	40% of the face value will have a warrant attached to it.

C	Remaining 30% of face value will be redeemed at the end of 4 th , 5 th and 6 th year in proportion of 4:3:3
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The following are the options available to the investor:

- Exchange Part B and warrant for one equity share at the end of the 2nd year.
- Retain Part B and let the warrant lapse. In that case, Part B will be redeemed at the end of the 6th year.

For last six years the company's earnings are growing at a rate of 36% p.a. and is expected that the growth rate will decline linearly during the next 6 years and stabilize at 12% thereafter. Retention ratio of the firm is 0.75. The required rate of return of the investor is 14.5%. Assume that the equity shares are traded at the intrinsic value at the end of six years and investor wants to sell all the equity holdings at the end of the six years.

You are **required** to determine whether it is desirable to invest in the debentures and which option the investor would choose.

(8 marks)

- A bond issued by Greaves Metal Ltd. is selling presently at a face value of Rs.100 and pays coupon rate at the rate of 13% p.a. in arrears which will be redeemed at Rs.113 after five years.

[< Answer >](#)

The 'n' years spot rate of interest, y_n is given by $y_n(\%) = 8.5 + \frac{n}{6}$ where, $n = 1, 2, 3, 4$ and 5 . The term structure of interest rates is flat and pure expectation theory holds good.

You are **required** to calculate

- The implied one year forward rates applicable at time $t = 3$ and $t = 4$
- The value of the bond at time 0
- The duration of the above bond
- Change in bond price for 50 basis point increase in interest rates.

(2 + 2 + 3 + 2 = 9 marks)

- Data for 12-days trend of securities traded on NSE is given below.

[< Answer >](#)

Days	Advances	Declines	Total number of issues traded
1	825	93	928
2	645	262	932
3	553	353	926
4	823	110	940
5	794	134	938
6	455	466	939
7	597	253	876

Days	Advances	Declines	Total number of issues traded
8	60	871	940
9	241	675	936
10	290	612	935
11	492	415	933
12	769	141	936

You are **required** to calculate:

- Short-period A-D line
- Long period A-D line
- Explain in what way the two lines provide different information?

(2 + 4 + 2 = 8 marks)

5. Ms.Riddhi bought two futures contracts of corn on 3rd September 2006 and sold them on 9th September. She again sold two contracts on 11th September and bought them on 13th September. Each contract consists of 5000 bushels. The settlement prices of corn bushel during 12 consecutive days are as follows:

[< Answer >](#)

Days	Settlement Price(in cents)
3rd Sep	545
4 th Sep	548
5 th Sep	552
6 th Sep	547
7 th Sep	541
8 th Sep	545
9 th Sep	549
11 th Sep	553
12 th Sep	556
13 th Sep	559

The initial and maintenance margin to be deposited with the clearing house are \$400 and \$300 respectively. Ms.Riddhi has already deposited \$100 with the broker.

Given this, you are **required** to prepare:

- Daily gain and loss along with cumulative trading profits and losses.
- Equity and margin account.

(4 + 4 = 8 marks)

6. Consider the following prices of the stock of Kataria Motors Ltd. and the corresponding value of the Market Index:

[< Answer >](#)

End of Month	Kataria Motors (Rs.)	Closing Value of Market Index
October 2005	514.30	2312.30
November 2005	529.90	2384.65
December 2005	531.60	2601.40
January 2006	538.95	2370.95
February 2006	587.90	2652.25
March 2006	585.85	2836.55
April 2006	598.80	3001.10
May 2006	620.30	3074.70
June 2006	730.50	3402.55
July 2006	788.90	3557.60

You are **required** to calculate:

- The characteristic line for stock of Kataria Motors.
- The proportions of systematic risk and unsystematic risk in the total risk of the stock of Kataria Motors.

(4 + 3 = 7 marks)

END OF SECTION B

Section C : Applied Theory (20 Marks)

- This section consists of questions with serial number 7 - 8.
- Answer **all** questions.
- Marks are indicated against each question.
- Do not spend more than 25 -30 minutes on section C.

7. It is more difficult to liquidate a minority interest in a closely held company than liquidate in a controlling interest. Discuss the various methods of valuing minority interest.

[< Answer >](#)

(10 marks)

8. Listing of securities on the stock exchanges is advantageous to the company as well as to the investors. Discuss.

[< Answer >](#)

(10 marks)

END OF SECTION C

END OF QUESTION PAPER

Suggested Answers
Security Analysis - I (211) : October 2006

Section A : Basic Concepts

1. Answer : (c)

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Reason:

	Ranbaxy (R _A)	Pfizer (P _F)
Expected return (E)	43.55	44.20
Variance (σ^2)	247.75	615.16

$$\text{Co-variance } \sigma_{(R_A P_F)} = [(65 - 43.55)(78 - 44.20) \times 0.35] + [(32 - 43.55)(26 - 44.20) \times 0.65] \\ = 390.39$$

$$\text{Portfolio Variance } (\sigma^2) = 247.75 \times (0.40)^2 + 615.16 \times (0.60)^2 + 2 \times 0.40 \times 0.60 \times 390.39 \\ = 448.44$$

$$\text{Standard deviation } (\sigma) = \sqrt{448.44} = 21.17\%$$

2. Answer : (a)

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Reason: The applications of ex-ante SMLs are:

- I. Identifying undervalued securities.
- II. Determining the consensus, 'price of risk' implicit in current market prices.

Other statements are the applications of ex-post SML's. Hence option (a) is said to be correct answer.

3. Answer : (b)

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Reason: Allocation 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.

4. Answer : (e)

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Reason: The major source of exit barriers are as follows:

1. Specialized assets
2. Fixed costs of exit
3. Strategic relationships
4. Emotional barriers
5. Government and social restrictions.

5. Answer : (b)

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$$\text{Reason: CEPS} = \frac{\text{PAT} + \text{Depreciation}}{\text{No. of Shares}} = \frac{162.83 + 5.46}{75} = 2.24$$

6. Answer : (e)

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Reason: Switching from the accrual basis of accounting for gratuity to cash basis during lean years to save on the provision for gratuity will show higher profit figure. Hence, statement (I) is true. Under inflationary circumstances, a company may switch over from the LIFO method to FIFO method and increase its profits and switching from FIFO to LIFO during decreasing prices result in increased profits. During decreasing prices, under FIFO method of inventory valuation, the value of stock consumed will be high and profits will be low whereas under LIFO, the stock consumed will be low and profits will be high. Hence, switching from FIFO to LIFO the profits will be increased and statement (II) is correct. Capitalizing the patent rights which were previously written off will also lead to higher profit figures. Hence, statement (III) is also true.

Hence, option (e) is the correct answer.

7. Answer : (d)

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Reason:
$$Po = \frac{DPS}{r - g_n} = \frac{4.25}{0.135 - 0.10} = \text{Rs. } 121.43$$

$$\frac{P_0}{Sales} = \frac{NPM \times \text{Pay-out ratio}}{r - g_n}$$

$$\frac{121.43}{240} = \frac{x \times 0.5}{0.135 - 0.10}$$

$$x = 3.54\%$$

8. Answer : (c)

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Reason:
$$\text{New Base year Average} = \text{Old Base Year Average} \times \frac{\text{NewMarketValue}}{\text{OldMarketValue}}$$

$$1010 = X \times \frac{(2500 + 150)}{2500}$$

$$X = 952.83$$

Thus, Old Base Year Average is Rs. 952.83 crore.

Hence, option (c) is the correct answer.

9. Answer : (b)

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Reason: Momentum is used to identify the trend reversal before it takes place.

Therefore, Option (b) is the correct answer.

10. Answer : (c)

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Reason: An order that allows the price to be specified while entering the order into the system is said to be Limit Price Order while an order to buy or sell securities at the best price obtainable at the time of entering the order is Market Price Order. Hence option (I) and option (III) are said to be false. Thus option (c) is said to be the correct answer.

11. Answer : (b)

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Reason:

$$ROE = \text{Net profit margin} \times \text{Asset turnover ratio} \times \text{Financial leverage}$$

$$12 = 6 \times 1 \times \text{Financial leverage}$$

$$\therefore \text{Financial leverage} = 2 = \frac{\text{Total asset}}{\text{Net worth}}$$

$$\therefore \frac{\text{Debt}}{\text{Total assets}} = 0.50$$

Therefore, Option (b) is the correct answer.

12. Answer : (d)

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Reason : $P/BV = ROE \times [\text{pay-out ratio} \times (1+g) \times (1-(1+g)^n/(1+r)^n) / r-g] + [\text{pay-out ratio}_n \times (1-g)^n (1+g_n) / (r-g_n)(1+r)^n]$

$$0.15 \times \left[\frac{(0.3)(1.16) \left\{ 1 - \frac{(1.16)^4}{(1.12)^4} \right\}}{0.12 - 0.16} \right] + \left[\frac{0.48(1 - 0.16)^4 (1.10)}{(0.12 - 0.10)(1.12)^4} \right]$$

$$= 0.15 \times (1.311 + 8.353) = 1.45$$

13. Answer : (e)

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Reason: All the statements are said to be the advantages of P/S ratio. Hence option (e) is said to be the answer.

14. Answer : (b)

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Reason: Volumes reduce as the symmetrical triangle narrows towards the apex. Other statements are true with respect to triangles.

Therefore, Option (b) is the correct answer.

15. Answer : (b)

[< TOP >](#)

Reason: In case of rising wedge, the boundary lines slope upward with the lower line being at a steeper angle than the upper line

Therefore, Option (b) is the correct answer.

16. Answer : (a)

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Reason:

$$\text{Standard Error} = \sigma_r = \sqrt{\frac{2n_1 n_2 (2n_1 n_2 - n_1 - n_2)}{(n_1 + n_2)^2 (n_1 + n_2 - 1)}}$$

$$\text{Standard Error} = \sigma_r = \sqrt{\frac{2(21)(15)[(2)(21) \times (15) - 21 - 15]}{(21 + 15)^2 (21 + 15 - 1)}} = \sqrt{\frac{374220}{45360}} = 2.87.$$

17. Answer : (e)

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Reason: For bonds with a shorter term to maturity, realized yield will be closer to the YTM. Other statements are said to be false. Hence option (e) is said to be the correct answer.

18. Answer : (a)

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Reason: Post tax yield to maturity = cost of acquisition $(1+r)^{15}$ = Post tax redemption value

$$\begin{aligned} &= 480.50(1+r)^{15} = 97164.16 \\ &= (1+r)^{15} = 202.21 \\ &= 42.47\% \end{aligned}$$

19. Answer : (d)

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Reason: Real Estate Fund is of close-ended type. Hence, statement (d) is incorrect. All other statements are correct. Hence, option (d) is the correct answer.

20. Answer : (c)

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

21. Answer : (a) [< TOP >](#)
Reason: The advantages of Cox, Ingersoll and Ross (CIR) model are
a Mean and variance of the factors return can be estimated directly by observing the time series of factors returns.
b Because of continuously defined maturities in the model, exposure can be calculated for zero-coupon bonds of any maturity without recourse to approximation or interpolation.
c It is consistent with the valuation of fixed income securities.
Hence option (a) is said to be the correct answer.
22. Answer : (c) [< TOP >](#)
Reason: When mutual fund managers do not on average make superior returns that means using public information any abnormal return is not possible and this supports semi-strong form of market hypothesis. Hence (d) is not correct. Trend analysis will be worthless if historical information cannot be used for superior returns and this also supports semi-strong form of market efficiency. Hence (b) is not correct. If positive abnormal returns can be expected from low P/E stock it signifies that publicly available information can be used to gain abnormal return and this is in against semi-strong form of market efficiency. However, if no investor can make superior profits by buying or selling stock after the announcement of expected rise in dividends it is in accordance with semi-strong form efficiency rules. According to this for, current stock prices reflect all publicly available information such as earnings, stock and cash dividends, interest rate changes etc. And so an investor cannot make superior profits by changing his portfolio according to the changes in the interest rates. Hence, statement (e) also supports semi-strong form of market efficiency.
Hence (c) is correct answer.
23. Answer : (c) [< TOP >](#)
Reason: Intrinsic value = Rs.380 – Rs.370 = Rs.10
Time value = Rs.16 – Rs.10 = Rs.6
24. Answer : (a) [< TOP >](#)
Reason: Conversion parity price = Bond Price/Number of shares on conversion per warrant
 $35.50 = x/25$
 $x = 887.50$
25. Answer : (b) [< TOP >](#)
Reason: Option -adjusted duration = $\text{Price}_{\text{NCB}}/\text{Price}_{\text{CB}} \times \text{Duration}_{\text{NCB}} (1-\text{Delta})$
 $= 235.50/132.00 \times 5 (1-0.872) = 1.142 \text{ years}$
26. Answer : (c) [< TOP >](#)
Reason: Properties of duration is as follows:
1. For all bonds, which pay periodic coupons, duration is less than the term to maturity.
2. A bond's duration will be equal to its term to maturity if, and only if it is a zero-coupon bond.
3. As the maturity of the coupon-bearing bond is lengthened, duration also increases albeit at a slower rate.
4. The duration of a perpetual bond is equal to $(1+r)/r$ where r = yield to maturity.
27. Answer : (d) [< TOP >](#)
Reason: If depreciation is included in the calculation of the capital formation, then it is called gross capital formation, if not it is called net capital formation. Other statements are true with respect to capital formation.
Therefore, option (d) is the correct answer.

28. Answer : (a) [<TOP>](#)
Reason: This model can be meaningful for future projections if and only if the estimated co-efficient are found to be acceptable in respect of their stability over time. Other statements are said to be false. Hence option (a) is said to be the correct answer.
29. Answer : (c) [<TOP>](#)
Reason: The beta of the portfolio consisting of two securities given that money is allotted equally between the two assets = $1.1 \times 0.5 + 1.2 \times 0.5 = 1.15$

The systematic risk of a portfolio = $\beta^2 \sigma_m^2$
Substituting the values, we get
 $(1.15)^2 \times 400 = 529(\%)^2$. Hence the correct answer is (c).
30. Answer : (b) [<TOP>](#)
Reason: The longer it takes for prices to move out of the pattern, the stronger is the base of the new trend. Therefore, option (b) is the correct answer.

Section B : Problems

1. [<TOP>](#)

Growth in EPS (%)	EPS	P/E Ratio	Price	Probability EPS	Probability P/E	Joint Probability
0	12	13	156	0.13	0.35	0.046
0	12	16	192	0.13	0.20	0.026
0	12	20	240	0.13	0.30	0.039
0	12	23	276	0.13	0.15	0.020
15	13.8	13	179.4	0.22	0.35	0.077
15	13.8	16	220.8	0.22	0.20	0.044
15	13.8	20	276	0.22	0.30	0.066
15	13.8	23	317.4	0.22	0.15	0.033
25	15	13	195	0.32	0.35	0.112
25	15	16	240	0.32	0.20	0.064
25	15	20	300	0.32	0.30	0.096
25	15	23	345	0.32	0.15	0.048
30	15.6	13	202.8	0.10	0.35	0.035
30	15.6	16	249.6	0.10	0.20	0.020
30	15.6	20	312	0.10	0.30	0.030
30	15.6	23	358.8	0.10	0.15	0.015
40	16.8	13	218.4	0.23	0.35	0.081
40	16.8	16	268.8	0.23	0.20	0.046
40	16.8	20	336	0.23	0.30	0.069
40	16.8	23	386.4	0.23	0.15	0.035
		Total	5270.4			
		Average Price	255.42			

(Price – Avg. Price)	(Price – Average Price) ²	(Price – Average Price) ² × Prob.
-99.42	9884.34	454.68
-63.42	4022.10	104.57
-15.42	237.78	9.27
20.58	423.54	8.47
-76.02	5779.04	444.99
-34.62	1198.54	52.74

20.58	423.54	27.95
61.98	3841.52	126.77
-60.42	3650.58	408.86
-15.42	237.78	15.22
44.58	1987.38	190.79
89.58	8024.15	385.16
-52.62	2768.86	96.91
-5.82	33.87	0.6774
56.58	3201.29	96.04
103.38	10687.42	160.31
-37.02	1370.48	111.00
13.38	179.02	8.23
80.58	6493.14	448.03
130.98	17155.76	600.45
		3751.11
	Standard deviation	61.25

The probability required to achieve the target return should be more than 65%.

Let 'x' be the divestment price

Value of Z should be - 0.39

$$Z = \frac{x - \mu}{\sigma} \geq -0.39$$

$$\frac{x - 255.42}{61.25} \geq -0.39$$

$$x \geq 231.53$$

Target return $\geq 50\%$

$$\frac{231.53 - P}{P} \geq 0.50$$

$$\text{i.e. } P \leq 154.36.$$

Hence, ILFS Venture Fund should invest at the rate of 154.36 per share

2. The debenture will be desirable by investor if the present value of the cash flows from the debenture is greater than the issue price.

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Let us assume EPS to be x.

Retention ratio = 75%

Payout ratio = $1 - 0.75 = 0.25$ or 25%

DPS = $x \times 0.25 = 0.25x$

Growth rate in 6th years and afterwards = 12%

Decline in growth rate every year.

$$\frac{36 - 12}{6} = 4\%$$

growth rate for 1st year = $36 - 4 = 32\%$

growth rate for 2nd year = $32 - 4 = 28\%$

growth rate for 3rd year = $28 - 4 = 24\%$

growth rate for 4th year = $24 - 4 = 20\%$

growth rate for 5th year = $20 - 4 = 16\%$

growth rate for 6th year = $16 - 4 = 12\%$

Dividend for each year

Year	Dividend	
------	----------	--

1	$0.25x \times 1.32$	$0.33x$
2	$0.33x \times 1.28$	$0.42x$
3	$0.42x \times 1.24$	$0.52x$
4	$0.52x \times 1.20$	$0.62x$
5	$0.62x \times 1.16$	$0.72x$
6	$0.72x \times 1.12$	$0.81x$

Value of the stock at the end of 6th year

$$\frac{D_6(1+g)}{k_e - g} = \frac{0.81x(1.12)}{0.145 - 0.12} = \frac{0.9072x}{0.025} = \text{Rs.}36.288x$$

OPTION I : Exchange part B and warrant for one equity share at the end of 2nd year.

Year	Dividend	Interest	Stock/ Redemption Value	Total Inflow	PVIF @ 14.5%	PV of Cash Flows
1	0.33x	66.50		$0.33x + 66.50$	0.8734	$0.2882x + 58.08$
2	0.42x	66.50		$0.42x + 66.50$	0.7628	$0.3204x + 50.73$
3	$0.52x \times 2$	28.50		$1.04x + 28.50$	0.6661	$0.6927x + 18.98$
4	$0.62x \times 2$	28.50	120	$1.24x + 148.50$	0.5818	$0.7214x + 86.40$
5	$0.72x \times 2$	17.10	90	$1.44x + 107.10$	0.5081	$0.7317x + 54.42$
6	$0.81x \times 2$	8.55	$2 \times 36.288x + 90$	$74.20x + 98.55$	0.4438	$.32.93x + 43.74$
						$35.68x + 312.35$

OPTION II: Retain Part B and let the warrant lapse

Year	Dividend	Interest	Stock/ Redemption Value	Total Inflow	PVIF @ 14.5%	PV of Cash Flows
1	0.33x	66.50		$0.33x + 66.50$	0.8734	$0.2882x + 58.08$
2	0.42x	66.50		$0.42x + 66.50$	0.7628	$0.3204x + 50.73$
3	0.52x	66.50		$0.52x + 66.50$	0.6661	$0.3464x + 44.30$
4	0.62x	66.50	120	$0.62x + 186.50$	0.5818	$0.3607x + 108.51$
5	0.72x	55.10	90	$0.72x + 145.10$	0.5081	$0.3658x + 73.73$
6	0.81x	46.55	$36.288x + 90$	$37.098x + 136.55$	0.4438	$16.46x + 60.60$
						$18.15x + 395.95$

The minimum EPS for option I to earn more than Rs.850.00 in present value terms is the value for 'x' in the following

$$35.68x + 312.35 \geq 850.00$$

$$35.68x \geq 850 - 312.35$$

$$x = 15.06$$

Similarly in the II option the minimum EPS is value of 'x' in the following

$$18.15x + 395.95 \geq 850$$

$$18.15x \geq 850 - 395.95$$

$$x = 25.02$$

If EPS is greater than Rs.15.07, investment in PCD is desirable and as the EPS required is more in option II, option I should be opted by the investor.

3. a. We can find the forward rates by f_3 and f_4 using spot rate y_1, y_2, y_3, y_4 , and y_5 :

$$(1 + y_4)^4 = (1 + y_3)^3 (1 + f_3) \text{ and}$$

$$(1 + y_5)^5 = (1 + y_4)^4 (1 + f_4)$$

For, f_3

$$(1.092)^4 = (1.09)^3 (1 + f_3)$$

$$f_3 = 9.80\%$$

For, f_4

$$(1.093)^5 = (1.092)^4 (1 + f_4)$$

$$f_4 = 9.70\%$$

- b. The value of the bond at time $t = 0$

$$13 (\text{PVIF}_{8.7\%, 1} + \text{PVIF}_{8.8\%, 2} + \text{PVIF}_{9.0\%, 3} + \text{PVIF}_{9.2\%, 4} + \text{PVIF}_{9.3\%, 5}) + 113 \times \text{PVIF}_{9.3\%, 5}$$

$$= 13 (0.9199 + 0.8448 + 0.7722 + 0.7032 + 0.6410) + 113 \times 0.6410$$

$$= 122.88$$

- c. $100 = 13 \text{PVIFA}_{(r, 5)} + 113 \text{PVIF}_{(r, 5)}$

$$r = 15\%$$

Duration

$$\frac{r_c}{r_d} \times \text{PVIFA}_{(r_d, n)} \times (1 + r_d) + \left(1 - \frac{r_c}{r_d}\right) \times n$$

$$= \frac{0.13}{0.15} \times \text{PVIFA}_{(15\%, 5)} \times (1.15) + \left(1 - \frac{0.13}{0.15}\right) \times 5$$

$$= 3.34 + 0.67$$

$$= 4.01 \text{ years}$$

$$\frac{D}{1 + \frac{r_d}{f}} = \frac{4.01}{1.15}$$

- d. $D_{\text{mod}} = \frac{D}{f} = \frac{4.01}{1.15} = 3.49 \text{ years}$

$$\frac{\Delta P_o}{P_o} \times 100 = -D_{\text{mod}} \times \frac{\Delta BP}{100}$$

$$= -3.49 \text{ years} \times 50/100 = -1.745\%$$

i.e., 1.745% fall in bond price.

Therefore new price = $100 (1 - 0.01745) = \text{Rs. } 98.26$

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

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	928	825	93	732	732
2	932	645	262	383	1115
3	926	553	353	200	1315
4	940	823	110	713	2028
5	938	794	134	660	2688
6	939	455	466	-11	2677
7	876	597	253	344	3021
8	940	60	871	-811	2210
9	936	241	675	-434	1776
10	935	290	612	-322	1454

11	933	492	415	77	1531
12	936	769	141	628	2159

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 A/U-D/U.

Days	Issues traded (1)	Advances (2)	Declines (3)	Unchanged (4)	(2)/(4) x 100 (5)	(3)/(4) x 100 (6)	(5)-(6) (7)	$\sqrt{(5)-(6)}$ (8)	Cumulative (A - D) (9)
1	928	825	93	10	8250.00	930.00	7320.00	85.56	85.56
2	932	645	262	25	2580.00	1048.00	1532.00	39.14	124.70
3	926	553	353	20	2765.00	1765.00	1000.00	31.62	156.32
4	940	823	110	7	11757.14	1571.43	10185.71	100.92	257.24
5	938	794	134	10	7940.00	1340.00	6600.00	81.24	338.49
6	939	455	466	18	2527.78	2588.89	-61.11	-7.81	330.68
7	876	597	253	26	2296.15	973.08	1323.08	36.37	367.05
8	940	60	871	9	666.67	9677.78	-9011.11	-94.93	272.12
9	936	241	675	20	1205.00	3375.00	-2170.00	-46.58	225.54
10	935	290	612	33	878.79	1854.55	-975.76	-31.24	194.30
11	933	492	415	26	1892.31	1596.15	296.15	17.21	211.51
12	936	769	141	26	2957.69	542.31	2415.38	49.15	260.66

C. Both the lines are used for analysis of the extent of a trend. The major differences are

1. As the name suggests, the long period A-D line indicates the extent of a trend for the breadth of the market over long period.
2. Long-period A-D line includes the issues whose prices remain unchanged. This provides additional information on the market following a certain trend and can also indicate in advance a trend reversal.

5.

a.

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Daily Gain and Loss Account

Days	Trade Price (Cents/bushel)	Settlement price(cents/bushel)	Marked to market (in \$s)	Cumulative
3 rd Sep	545	545	-	-
4 th Sep		548	300	+300
5 th Sep		552	400	+700
6 th Sep		547	-500	+200
7 th Sep		541	-600	-400
8 th Sep		545	400	0
9 th Sep	549	549	400	+400
11 th Sep	553	553	-	-
12 th Sep		556	-300	+100
13 th Sep	559	559	-300	-200

b.

Equity and Margin account

Day	Transaction	Equity			Margin account		
		Beginning	Cash flows	Ending	Margin Call	Deficiency	Excess
2 nd Sep	Deposits \$100						\$100
3 rd Sep	Buys two contracts	100		100	700	700	

4 th Sep	Deposits \$700	800	300	1100			300
5 th Sep		1100	400	1500			700
6 th Sep		1500	-500	1000			200
7 th Sep		1000	-600	400	400	400	
8 th Sep	Deposits \$200	800	400	1200			400
9 th Sep	Sells two contracts	1200	400	1600			800

11 th Sep	Sells two contracts	1400	-	1400			800
12 th Sep		1400	-300	1100			300
13 th Sep	Bought two contracts	1100	-300	800			0

6. a. The returns on Kataria Motors and market index are as follows:

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Month	Return on the stock of Kataria Motors (y) %	$(y - \bar{y})$	$(y - \bar{y})^2$	Return on Market index (x) %	$(x - \bar{x})$	$(x - \bar{x})^2$	xy	x^2
October 2005								
November 2005	3.03	-1.97	3.88	3.13	-1.94	3.76	9.49	9.80
December 2005	0.32	-4.68	21.90	9.09	4.02	16.16	2.92	82.63
January 2006	1.38	-3.62	13.10	-8.86	-13.93	194.04	-12.25	78.50
February 2006	9.08	4.08	16.65	11.86	6.79	46.10	107.76	140.66
March 2006	-0.35	-5.35	28.62	6.95	1.88	3.53	-2.42	48.30
April 2006	2.21	-2.79	7.78	5.80	0.73	0.53	12.82	33.64
May 2006	3.59	-1.41	1.99	2.45	-2.62	6.86	8.81	6.00
June 2006	17.77	12.76	162.82	10.66	5.59	31.25	189.43	113.64
July 2006	7.99	2.99	8.94	4.56	-0.51	0.26	36.43	20.79
	$\bar{y} = 45.03/9 = 5.00$		$\Sigma (y - \bar{y})^2 = 265.68$	$45.65 \bar{x} = 5.07$		$\Sigma (x - \bar{x})^2 = 302.49$	$\Sigma xy = 352.99$	533.96

The regression equation between the two can be determined as follows:

$$\beta = \frac{n \Sigma xy - \Sigma x \Sigma y}{n \Sigma x^2 - (\Sigma x)^2} = \frac{9 \times 352.99 - (45.65)(45.03)}{9 \times 533.96 - (45.65)^2} = 0.41$$

$$\alpha = (\Sigma y - \beta \Sigma x) \frac{1}{n} = [(45.03) - 0.41 \times (45.65)] \frac{1}{9} = 2.92$$

Mean return on market = 5.07

Characteristic line: $R_i = 2.92 + 0.41R_m$

Where R_i is the return on Kataria Motors and R_m is the return on the market.

b. Variance of returns from Kataria Motors $\sigma_s^2 = \frac{\Sigma (y - \bar{y})^2}{n - 1} = \frac{265.68}{8} = 33.21$

Standard deviation of returns on Kataria Motors $\sigma_s = \sqrt{\sigma_s^2} = \sqrt{33.21} = 6.15$

$$\text{Variance of market return } \sigma_m^2 = \frac{\Sigma(x - \bar{x})^2}{n-1} = \frac{302.49}{8} = 37.81$$

$$\text{Standard deviation of market return } \sigma_m = \sqrt{37.81} = 6.15$$

$$\text{Explained variance} = \beta^2 \sigma_m^2 = 0.41^2 \times 37.81 = 6.35$$

$$\text{Proportion of explained variance} = \frac{6.35}{33.21} = 19.12\%$$

$$\text{Unexplained variance} = 1 - 0.1912 = 0.8088 = 80.88\%.$$

Section C: Applied Theory

7. Methods of Valuing Minority Interests

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1. Top down approach
2. Horizontal approach
3. Bottom-up approach

TOP-DOWN APPROACH

Steps involved in this method are,

1. Estimate the value of the equity of the firm on control basis
2. Calculate the minority owner's pro rata interest in the total
3. Estimate the amount of discounts, if any. In addition, estimation of a further discount for lack of marketability should also be made.

Step 1

Value of a firm is defined as the value of the classes of equity taken as a whole, assuming no long-term debt is involved. Any of the methods discussed in the earlier part of this chapter can be used to estimate the value of equity of a firm.

There is a significant difference between control evaluation and non-control evaluations due to the difference in the way business is analyzed by control buyers and non-control buyers. Control buyers analyze asset values based on only a few situations. Non-control buyers tend to place emphasis on only earnings.

Step 2

If there is only a single class of stock, (i.e., no warrants or any sort of contingent claims are outstanding) the proportionate value per share is nothing but the firm value divided by the number of shares outstanding. But when there are different classes of interests, firm value must be allocated among them thereby reflecting any dilution from any contingent interest.

Step 3

Discounting is done in two steps. In the first step, discounting is done for minority interest and then in the second step, it is done for marketability.

HORIZONTAL APPROACH

A minority interest may be valued relatively by referring to other minority interest transactions. When the value calculated using the valuation approach is a "publicly traded equivalent value", then the value needs to be discounted only for lack of marketability. If the value is compared directly with other closely held minority interests, no discounts or premiums may be necessary. But in the absence of past transactions in company's own stock, it is very difficult to find reliable data on minority transactions in representative closely held company stocks.

BOTTOM-UP APPROACH

Minority interest holders realize income in the form of dividends and capital gains (proceeds on the sales) In this approach, first the dividend cash flows (timing and amounts) should be estimated followed by projection of capital gains (timing and amount). These two cash flows have to be then discounted at an appropriate discount rate, which reflects the degree of uncertainty of realizing the expected return at the time and in the amounts projected. The lack of marketability of the closely held minority interest can be captured in the discount rate.

8. Advantages of Listing

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Listing of securities on the stock exchanges is advantageous to the company as well as to the investors as set out hereunder:

a. To the Company

- i. The company enjoys concessions under Direct Tax Laws – In such companies the public is substantially interested resulting in lower rate of income tax payable by them;
- ii. The company gains national and international importance by its share value quoted on the stock exchanges;
- iii. Financial institutions/bankers extend term loan facilities in the form of rupee currency and foreign currency loan;
- iv. It helps the company to mobilize resource from the shareholders through 'Rights Issue' for programs of expansion and modernization without depending on the financial institutions in line with the government policies'
- v. It ensures wide distribution of shareholding thus avoiding fears of easy takeover of the organization by others.

b. To the Investors

- i. Since the securities are officially traded, liquidity of investment by the investors is well ensured;
- ii. Rights entitlement in respect of further issues can be disposed of in the market;
- iii. Listed securities are well preferred by bankers for extending loan facility;
- iv. Official quotations of the securities on the stock exchanges corroborate the valuation taken by the investors for purposes of tax assessments under Income Tax Act, Wealth Tax Act, etc'
- v. Since securities are quoted, there is no secrecy of the price realization of securities sold by the investors'
- vi. The rules of the stock exchange protect the interest of the investors in respect of their holdings'
- vii. Listed companies are obligated to furnish unaudited financial results on a half-yearly basis within two months of the expiry of the period. The said details enable the investing public to appreciate the financial results of the company in between the financial year;
- viii. Takeover offers concerning listed companies are to be announced to the public. This will enable the investing public to exercise its discretion on such matters.

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