

Question Paper

Security Analysis - I (211) : July 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. Which of the following statements is **true** with respect to treasury bills? [< Answer >](#)
 - (a) The sale of T-bill is carried out at the public debt office of the RBI
 - (b) The 364-days T-bill of Rs.100 sold at Rs.96 earns a return of 4.30%
 - (c) The 91-days T-bill of Rs.100 sold at Rs.99 have a discount of 4.20%
 - (d) The discount rate are determined by market forces and on a competitive basis
 - (e) The 364-days T-bill auction is carried out by the RBI weekly.

2. Which of the following statements is **not true** with respect to the Security Market Lines (SML)? [< Answer >](#)
 - (a) SML represents the normal trade-off between return and risk
 - (b) The vertical distance of the security's plot on the graph from the SML is called the security's alpha
 - (c) Validity of the CAPM can be tested by constructing ex-post SML
 - (d) Ex-post SMLs are used to evaluate the performance of portfolio managers
 - (e) The slope of the SML is the beta for the particular security involved.

3. Historically, when the market return changed by 10%, the return on the stock of Arihant Ltd. changed by 16%. The variance of market return is $257.81\%^2$. The systematic risk for Arihant Ltd. is [< Answer >](#)
 - (a) $160\%^2$
 - (b) $320\%^2$
 - (c) $480\%^2$
 - (d) $660\%^2$
 - (e) $720\%^2$

4. Which of the following statement(s) is/are **true**? [< Answer >](#)
 - I. Operational 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.
 - II. Allocational efficiency is said to exist if the operating costs are minimum possible to the participants, but still provide a fair return to the intermediaries for their services.
 - III. Full insurance efficiency is said to exist if participants can adopt hedging strategies as effective tools against possible risks in future.
 - IV. Information arbitrage efficiency is said to exist if the price of the asset is equal to its intrinsic value.
 - (a) Only (II) above
 - (b) Only (III) above
 - (c) Both (I) and (III) above
 - (d) Both (II) and (IV) above
 - (e) (II), (III) and (IV) above.

5. A 20-year maturity, 12% coupon bond (Face value Rs.1000) paying coupons semi-annually is callable in five years at a call price of Rs.1,050. The bond currently sells at a YTM of 10.5%. The yield to call of this bond is [< Answer >](#)

(a) 3.89%
(b) 4.00%
(c) 4.19%
(d) 4.59%
(e) 4.81%.

6. Which of the following statements is **not true** regarding the Key Rate Duration (KRD)? [< Answer >](#)

(a) KRD can be used to replicate a portfolio of a bond with embedded options created with zero-coupon bonds
(b) The sum of KRDs is equal to the effective duration
(c) A portfolio's KRD is the sum of the KRDs of the securities of the portfolio
(d) KRD can capture the influence of multiple market forces on yield curve movement
(e) KRD is used when shifts in the yield curve are non-parallel.

7. Which of the following statement(s) is/are **not true** regarding the Price/Sales ratio? [< Answer >](#)

I. P/S ratio is useful for valuing companies even with no dividends at all.
II. P/S ratio can be positive or negative.
III. Firms with low profit margins and high P/S ratio are undervalued.
IV. P/S ratio is not influenced by accounting methods.

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

8. Which of the following statements is **not true**? [< Answer >](#)

(a) Secured debentures normally carry a fixed or floating charge on the immovable assets of the company by way of an equitable mortgage
(b) Unregistered debentures can be transferred only by executing a transfer deed and filing a copy of it with the company
(c) Convertible zero-coupon bonds can be redeemed by allocation of ordinary shares
(d) Debenture Redemption Reserve has to be created by the company out of its profits to the extent of 50% of the amount of debentures to be redeemed before the date of redemption
(e) In case of debentures with call option, the call price is maximum at the beginning of the effective call option period and declines step-wise towards the face value as the call date approaches the maturity date.

9. An index model regression applied to past monthly returns in ACC stock price produces the following estimates, which are believed to be stable over time: [< Answer >](#)

$$r_{ACC} = 0.15\% + 1.2 r_M$$

If the return on market index subsequently rises by 8% and return on ACC's stock rises by 7%, what is the abnormal return earned on ACC's stock?

(a) 0.55%
(b) -1.65%
(c) -2.75%
(d) 1.65%
(e) 2.75%.

10. Which of the following statements is **not true**?

[< Answer >](#)

- (a) According to Liquidity Preference Theory, spenders keep a proportion of their assets as cash balances for maintaining liquidity
- (b) According to this Pure Expectations Theory, the current term structure of interest rates is determined by the consensus forecast of future interest rates
- (c) According to the Loanable Funds Theory, interest rates in different sectors in the economy can be predicted
- (d) According to the Liquidity Premium Theory, the investors are not indifferent to risk and they charge higher rates than the expected future rates, if the maturity of the instrument increases
- (e) According to the Preferred Habitat Theory, it is a pre-requisite that the liquidity premium should increase at a uniform rate with maturity.

11. Which of the following statement(s) is/are **not true**?

[< Answer >](#)

- I. Runaway gaps occur halfway through a trend.
 - II. A series of breakaway gaps indicate that an exhaustion gap is round the corner.
 - III. Exhaustion gap is treated as a sign of consolidation.
 - IV. Island is separated by an exhaustion gap and a runaway gap.
- (a) Only (I) above
 - (b) Only (II) above
 - (c) Only (IV) above
 - (d) Both (I) and (III) above
 - (e) Both (II) and (IV) above.

12. Which of the following statements is **true** with respect to bond price theorems?

[< Answer >](#)

- (a) Given the maturity, for equal fixed increases and decreases in the YTM, price movements are symmetrical
- (b) A change in a YTM affects the bonds with a higher YTM less than it affects the bonds with a lower YTM
- (c) For a given difference between YTM and coupon rate of the bonds, the longer the term to maturity, the lower will be the change in the price with change in YTM
- (d) The increase in the price of a bond associated with the changes in the interest rates will be at a diminishing rate as the term to maturity increases
- (e) For a given change in a bond's YTM, the percentage price change will be lower for low coupon bonds than for high coupon bonds.

13. Which of the following statements is/are **not true** with respect to an Exchange Traded Fund (ETF)?

[< Answer >](#)

- I. ETFs primarily invest in the securities of companies that are included in a selected market index.
 - II. The NAV of the ETF is equal to the value of the underlying index.
 - III. ETFs cannot be bought or sold on a daily basis like stocks.
- (a) Only (I) above
 - (b) Only (II) above
 - (c) Only (III) above
 - (d) Both (I) and (III) above
 - (e) Both (II) and (III) above.

14. Which of the following statements is **true** regarding the semi-strong form of Efficient Market Hypothesis?

[< Answer >](#)

- (a) Stock prices fully reflect all historical price information
- (b) Runs test is used to test the semi-strong form of market efficiency
- (c) Stock prices fully reflect all relevant information including insider information
- (d) Stock prices are not predictable using the publicly available information
- (e) Relationship between the historical P/E ratios and risk-adjusted market performance supports semi-strong form of market efficiency.

15. Which of the following statements is **not true** about the moving average?

[< Answer >](#)

- (a) Technical analysts observe moving averages more for crossovers than for the changes in direction
- (b) When the moving average rises above the price line, a reversal in bullish trend is signaled
- (c) The price line that falls below a rising moving average only indicates a secondary reaction and not a trend reversal
- (d) A moving average represents a smoothened trend and therefore does not act as a support/resistance line
- (e) If the moving average is flat or has already begun to change direction, a crossover by the price line is a fairly reliable indicator of trend reversal.

16. The Earnings per share (EPS) of a company registered an increase in the year 2005-2006. Which of the following arguments most seriously weakens this statement?

[< Answer >](#)

- (a) Book Value of Equity has increased
- (b) Debt to Net worth ratio has declined
- (c) Preference capital to Net worth ratio has increased
- (d) Corporate tax rate has declined
- (e) Rate of return on capital employed (r) and its spread over the interest rate (r-i) has increased.

17. The following are the closing prices of Ranbaxy stock on nine consecutive trading days in the month of April:

[< Answer >](#)

Days	Closing Prices (Rs.)
0	440.35
1	460.00
2	455.10
3	473.85
4	457.20
5	463.00
6	451.65
7	449.60
8	464.90

The relative strength index of the Ranbaxy's stock is

- (a) 40.66
- (b) 45.16
- (c) 48.56
- (d) 50.66
- (e) 51.66.

18. An investor writes 5 naked call option contracts. The option price is Rs.3.50, the strike price is Rs.60, and the stock price is Rs.57. If each option contract is of 100 shares, the initial margin to be deposited by the investor is

[< Answer >](#)

- (a) Rs.4,600
- (b) Rs.5,950
- (c) Rs.7,450
- (d) Rs.7,750
- (e) Rs.8,050.

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

[< Answer >](#)

- I. Convexity is used for measuring change in bond price for both small and large changes in yield.
- II. Coupon 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. Consider the following information:

[< Answer >](#)

Coupon (Annual)	Yield to Maturity	Maturity
12%	10.5%	15 years

If the YTM increases to 12%, the percentage change in the price of the bond using modified duration is

- (a) 8.065%
- (b) 8.375%
- (c) 8.765%
- (d) 9.265%
- (e) 9.675%.

21. Which of the following statement(s) is/are **true** regarding the Term Structure Factor Models?

[< Answer >](#)

- I. CIR Model can be implemented by regressing cross-sections of bond returns and their durations.
- II. Principal Components Models can be used to analyze the returns of zero-coupon bonds of varying maturities to extract a set of characteristic yield curve shifts, which can be defined at each maturity.
- III. Spot Rate Models can be used to identify factors with the durations of zero-coupon bonds at several points on the yield curve.
- IV. Functional Models assume that zero-coupon yield changes are not defined continuously in maturity.

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

22. Nilkamal Industries Ltd., a manufacturer of plastic ware, reported earnings per share of Rs.12.50 in 2006, on which it paid dividends per share of Rs.4.107. Earnings are expected to grow 15% a year from 2007 to 2011, during which period the dividend payout ratio is expected to remain unchanged. After 2011, the earnings growth rate is expected to drop to a stable 6%, and the payout ratio is expected to increase to 65% of earnings. The firm has a beta of 1.40 currently, and it is expected to have a beta of 1.10 at the end of 2011. The risk-free rate is 6.25% and the market risk premium is 5.5%. The expected price of the stock at the end of the year 2011 will be

[< Answer >](#)

- (a) Rs.235.90
- (b) Rs.243.90
- (c) Rs.274.92
- (d) Rs.285.70
- (e) Rs.294.70.

23. Which of the following statements is **not true** regarding the price-volume relationships? [< Answer >](#)

- (a) A price rise that is accompanied by expanding volume is not indicative of any trend reversal
- (b) If volumes obtained at a new high are lower, it is an indication of a trend reversal
- (c) A new high reached with a volume that is actually diminishing is a warning to a reversal in price
- (d) A distribution accompanied by increased volume is a bullish factor
- (e) Termination of a bear market is signaled by a selling climax.

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

- I. Market Value Added serves as a proxy for a firm's stock performance.
 - II. Economic Value Added can be applied to capital budgeting decisions.
 - III. Future Growth value to Market value ratio is used for performing sanity test.
 - IV. Market Value Added serves as a measure of firm's external performance.
- (a) Only (II) above
 - (b) Only (IV) above
 - (c) Both (II) and (IV) above
 - (d) (I), (II) and (III) above
 - (e) (II), (III) and (IV) above.

25. Which of the following statement(s) is/are **true** regarding the entry/exit barriers in an industry? [< Answer >](#)

- I. When entry barriers are high and exit barriers are low, profit potential is high but is associated with more risk.
 - II. Labour agreements, resettlement costs, maintaining capabilities for spare parts, switching costs, etc., are the few fixed costs of exit.
 - III. Learning curve and economies of scale are few entry barriers to a firm in a particular industry.
 - IV. Exit barriers are economic, strategic and emotional factors that drive companies to be in business despite earning low returns.
- (a) Only (I) above
 - (b) Both (I) and (II) above
 - (c) Both (II) and (III) above
 - (d) (II), (III) and (IV) above
 - (e) All (I), (II), (III) and (IV) above.

26. Which of the following statements is **true** regarding mutual funds? [< Answer >](#)

- (a) The shares of close-ended funds are redeemable at their NAV
- (b) Open-ended funds can sell unlimited number of units
- (c) The fund units are sold to the public at the NAV
- (d) Real estate fund is an open-ended fund
- (e) Specialized funds carry low risk.

27. Which of the following statements is **not true**? [< Answer >](#)

- (a) All market orders are day orders only and provide immediate liquidity to the market
- (b) A stop order to sell becomes a market order if the market price goes below the spot order price
- (c) Open orders are known as "good till cancelled" orders
- (d) In a market order, the investor is aware of the price at which the stock will be traded
- (e) In a stop limit order to buy, the investor can specify the maximum price that he is ready to pay for the stock.

28. Which of the following principles of Real Estate Appraisal is/are **true**?

[< Answer >](#)

- I. According to the Principle of Substitution, a rational owner will try to gain the maximum out of the resources he has.
 - II. According to the Principle of Change, price is function of demand and supply and value of property fluctuates with price.
 - III. According to the Principle of Marginal Productivity, the value of any factor of production or component of a property can add to or lower the value of the asset.
- (a) Only (I) above
 - (b) Only (II) above
 - (c) Only (III) above
 - (d) Both (I) and (II) above
 - (e) Both (II) and (III) above.

29. Change in which of the following accounting policies will **not** affect the profit figures reported between two time periods?

[< Answer >](#)

- (a) Treatment of R & D expenditure
- (b) Treatment of gratuity liability
- (c) Valuation of Inventories
- (d) Treatment of depreciation provisions
- (e) Revaluation of financial investment for treasury operations.

30. Which of the following statement(s) is/are **not true**?

[< Answer >](#)

- I. Detachable warrants are issued separately and not as part of a bond or a debenture issue.
 - II. In naked warrants, the holder has the option of converting the warrant into debt or equity or some other asset of the issuer.
 - III. Wedding warrants are attached to the host debentures and can be exercised only if the host debenture is surrendered.
 - IV. Callable warrants confer a right on the investor to sell the warrant back to the company at a fixed price before the expiry of a fixed period thereby limiting the risk.
- (a) Only (I) above
 - (b) Only (II) above
 - (c) Only (III) above
 - (d) Both (I) and (IV) above
 - (e) Both (II) 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. Consider the following zero-coupon curve:

[< Answer >](#)

Maturity (years)	Zero-coupon rate (%)
1	5.00
2	5.50
3	5.75
4	5.90
5	6.00

An investor is interested in purchasing a 5-years bond with a face value of Rs.100, which delivers coupons in the following manner:

Years	Coupon (%)
1 - 2	8.0
3 - 4	8.5
5	9.0

You are **required** to

- Compute the price and YTM of this bond at the present term structure and when the zero-coupon curve increases instantaneously and uniformly by 0.5%. Indicate the impact of this rate rise for the bondholder in both absolute and relative terms.
- Compute the investor's annual rate of return considering that the zero-coupon curve remains stable over time and the investor holds the bond until maturity and reinvests the coupons at the zero-coupon rates.
- Compute the rate of return earned by the investor, if he purchases a one-year, two-year and a three-year zero coupon bond and sell all bonds after a year. The investor expects the yield curve to shift to left by 25 basis point across the zero coupon bonds after one year.

(3 + 2 + 3 = 8 marks)

2. Indo Medical Labs designs, manufactures and markets all the necessary equipment for mid range and super specialty hospitals. The company had reported earnings per share of Rs.1.50 in 2005, on which it paid no dividends. It had revenues of Rs.7.89 per share in 2005. It had capital expenditures of Rs.0.38 per share in 2005 and depreciation of Rs.0.16 per share in the same year. Earnings and revenues are expected to grow 20% a year during the high growth period. The earnings growth rate is expected to decline linearly over the following five years to a rate of 5% in 2015 and then stabilize at that rate. During the high growth and transition periods, capital spending and depreciation are expected to grow at the same rate as earnings, but are expected to offset each other when the firm reaches steady state. The working capital was 65% of revenues in 2005 and is expected to remain the same till 2015. The debt ratio for the company is 10%.

[< Answer >](#)

The stock is expected to have a beta of 1.45 for the high growth period (2006-2010), and it is expected to decline to 1.10 by the time the firm goes into steady state (in 2015). The risk-free rate

is 5.5%, and the market return is 12%.

You are **required** to estimate the present value per share, using the Three-Stage FCFE model.

(11 marks)

3. Considering that the assumptions of CAPM are valid, fill in the blanks in the following table:

[< Answer >](#)

Stock	Expected Return (%)	σ_i (%)	$\rho_{i,m}$	Systematic Risk (%) ²
Akhil Infotech Ltd.	–	7	–	12
Bewan Pharma Ltd.	9	–	1.05	5
Cute Textiles Ltd.	14	–	1.2	18

Assume that the variance on the market return is $9(\%)^2$.

(5 marks)

4. An analyst is considering an investment in the structured products. An investment in a 5-year bond with 50 warrants per Rs.10,000 is proposed. The coupon rate for the bond is 9.5% and the bond is trading at par value of Rs.100. Five warrants give right to buy 1 stock of the company at Rs.200. Currently the stock is trading at Rs.320.

[< Answer >](#)

You are **required** to

- Calculate the price of the bond without warrants, if the market indicates a redemption yield for bonds of the same quality and maturity of 12%.
- Calculate the implicit price of one warrant. Give the reason for any difference from the intrinsic value.
- Discuss how price volatility of the share is attached with the pricing of the warrant.

(1 + 5 + 2 = 8 marks)

5. A market analyst is keen on testing whether the Indian markets are exhibiting semi-strong form of efficiency. For the purpose he selected three companies, viz., Arun Motors Ltd., Bimal Infotech Ltd. and Celine Airlines Ltd., which declared higher dividends on March 15, 2006. He estimated the characteristic lines to study the relationship between the returns on these three companies and the return on the market index for a period of five years on a monthly basis up to December 15, 2005, which are as follows:

[< Answer >](#)

$$r_{A,t} = 1.40\% + 0.75r_{m,t}$$

$$r_{B,t} = 1.59\% + 1.23r_{m,t}$$

$$r_{C,t} = 1.92\% + 1.40r_{m,t}$$

The following table shows the returns on the stocks of the three companies and the market return for the period three months before and three months after the declaration of dividend:

Period (months)	Actual Return (%)			Market Return (%) $r_{m,t}$
	$r_{A,t}$	$r_{B,t}$	$r_{C,t}$	
Dec 15, 2005	12.14	12.56	13.05	11.45
Jan 15, 2006	12.52	12.79	13.42	11.85
Feb 15, 2006	12.05	13.04	13.58	12.00
Mar 15, 2006	11.89	12.43	13.25	12.25
Apr 15, 2006	12.63	13.62	14.42	12.60
May 15, 2006	12.16	13.16	14.20	11.95
Jun 15, 2006	12.84	13.32	14.45	11.20

You are **required** to verify the validity of semi-strong form of market efficiency in the Indian market using Event Studies.

(8 marks)

6. Mr. Ravi Jain estimates that there will be semi-annual cash outflows of Rs.25,000 for a period of three and half years, the first payment of which will commence from the end of two and half years from now. There is a cash outflow of Rs.1,20,000 at the end of sixth year from now. The cost of debt for similar debt in the market is 13%. Mr. Ravi Jain is considering immunizing the cash flows by investing in the two bonds i.e., Lakshmi Metals Ltd. (LML) bond and Government of Gujarat (GOG) bond. LML bond is a 12% semi-annual coupon bearing bond with a face value of Rs.100, maturing after 6 years, redeemable at a premium of 5% and is currently trading at Rs.106.94. Whereas GOG bond is a Zero coupon bond with a face value Rs.1000 maturing after 7 years and is currently traded at Rs.630.17.

[< Answer >](#)

As an analyst, you are **required** to determine the proportion of funds to be invested by Mr. Ravi in the LML and GOG bonds such that his payments are immunized.

(10 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. Trading procedures differ across different equity markets according to their operational set up and legal obligations. With respect to this, discuss the various differences seen in trading procedures.

[< Answer >](#)

(10 marks)

8. There are several factors at work in every sector and every industry of an economy. The dynamic nature of every industry keeps the pulses of the companies operating in each sector racing. Industry analysis looks at all those factors that potentially change the fortunes of the company. With respect to this discuss the key characteristics in an Industry Analysis.

[< Answer >](#)

(10 marks)

END OF SECTION C

END OF QUESTION PAPER

Suggested Answers

Security Analysis - I (211) : July 2006

Section A : Basic Concepts

1. Answer : (d) [< TOP >](#)
Reason : Sale of T-bill is now not applicable as it is now done through auction. The 364-day T-bill of Rs. 100 sold at Rs.96 earns a return of 4.17%. The 91-days T-bill of Rs.100 sold at Rs.99 have a discount of 4.01%. The 91 days T-bill auction is carried out by the RBI weekly and 364-days fortnightly. Option (d) is correct as now discount rate is determined by market forces and on a competitive basis.
Therefore option (d) is the correct answer.

2. Answer : (e) [< TOP >](#)
Reason : SML typically represents the average or normal trade-off between risk and return for a group of securities, where risk is measured typically, in terms of the securities betas. Statement (a) is true.
The amount by which a security's return differed from the normal return for its level of risk is simply the vertical distance of the security's plot on the graph from the SML. Statement (b) is true.
Ex-post SMLs are used to evaluate the performance of portfolio managers and to test the validity of CAPM. Statements (c) and (d) are true.
The slope of the characteristic line (not SML) is the beta for the particular security involved. Therefore statement (e) is not true. Hence (e) is the answer.

3. Answer : (d) [< TOP >](#)
Reason : 10% increase in Market return resulted in 16% increase in Arihant Ltd. stock. Thus the beta for the Arihant Ltd. stock is 1.6. Bow systematic risk is $\beta^2 \sigma_m^2 = (1.6^2)(257.81) = 660\%^2$

4. Answer : (b) [< TOP >](#)
Reason : Fundamental valuation efficiency is said to exist if the price of the asset is equal to its intrinsic value.
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.
Full insurance efficiency is said to exist if participants can adopt hedging strategies as effective tools against possible risks in future.
Operational efficiency is said to exist if the operating costs are minimum possible to the participants, but still provide a fair return to the intermediaries for their services.
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.
Statement (III) is true and statements (I), (II), and (IV) are not true. Hence (b) is the answer.

5. Answer : (e) [< TOP >](#)
Reason : Current price of the bond = $60 \times \text{PVIFA}_{(5.25\%, 40)} + 1000 \times \text{PVIF}_{(5.25\%, 40)}$
= Rs.1,124.406
Time to call = 5 years or 10 semi-annual periods
Price at which it is called is Rs.1,050. therefore value of redemption is Rs.1,050
Yield to call is the rate at which the PV of the coupons and the redemption value is equal to the current price, i.e., Rs.1,124.406.
 $\therefore 1,124.406 = 60 \times \text{PVIFA}_{(r\%, 10)} + 1050 \times \text{PVIF}_{(r\%, 10)}$
At $r = 5\%$, R.H.S = 1107.91
At $r = 4\%$, R.H.S = 1195.996
By interpolation,

$$R = 5\% - \frac{1124.406 - 1107.91}{1195.996 - 1107.91} = 5\% - 0.19\% = 4.81\%$$

Hence (e) is the answer.

6. Answer : (c) [<TOP>](#)
- Reason : KRD is a vector of number defining the price sensitivity of a security over the entire domain of possible movements of the yield curve. KRD can be used to replicate a portfolio of a bond with embedded options created with zero-coupon bonds/. The sum of KRDs is equal to the effective duration. A portfolio's KRD can be expressed as a weighted average of the KRDs of the securities of the portfolio. KRD can capture the influence of multiple market forces on yield curve movement. Effective duration is used when the shifts in the yield curve are parallel, but KRD is used when shifts in the yield curve are non-parallel. Hence statement (c) is not true. Hence (c) is the answer.
7. Answer : (d) [<TOP>](#)
- Reason : P/S ratio is useful for valuing companies even with no earnings, viz., no dividends at all. P/S ratio can never be negative. Firms with low profit margins and high P/S ratio are overvalued and those with high profit margins and low P/S ratios are undervalued. P/S ratio is not influenced by accounting methods used for depreciation, inventory, etc.,. Statements (I) and (IV) are true, and statements (II) and (III) are not true. Hence (d) is the answer.
8. Answer : (b) [<TOP>](#)
- Reason : Secured debentures normally carry a fixed or floating charge on the immovable assets of the company by way of an equitable mortgage. Unregistered debentures are freely transferable and can be transferred by a simple endorsement, while the registered debentures can be transferred only by executing a transfer deed and filing a copy of it with the company. Convertible zero-coupon bond is redeemed by allocation of ordinary shares. Debenture Redemption Reserve has to be created by the company out of its profits to the extent of 50% of the amount of debentures to be redeemed before the date of redemption. In case of debentures with call option, the call price is maximum at the start of the effective call option period and declines step-wise towards the face value as the call date approaches the maturity date. Hence statement (b) is not true and all other statements are true. Hence (b) is the answer.
9. Answer : (c) [<TOP>](#)
- Reason : Given $r_M = 8\%$
 Expected return on ACC's stock, $r_{ACC} = 0.15\% + 1.2 \times 8\% = 9.75\%$
 Since the actual return on ACC's stock is 7%,
 Abnormal return = Actual return – expected return = $7\% - 9.75\% = -2.75\%$
 Hence (c) is the answer.

10. Answer : (e)

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Reason : According to Liquidity Preference Theory, spenders keep a proportion of their assets as cash balances for maintaining liquidity.

According to this Pure Expectations Theory, the current term structure of interest rates is determined by the consensus forecast of future interest rates.

According to the loanable funds theory, interest rates in different sectors in the economy can be predicted as the theory focuses on the demand and supply aspects of the funds in an economy with different sectors like the household sector, the business sector and the government sector.

According to the Liquidity Premium Theory, the investors are not indifferent to risk and they charge higher rates than the expected future rates, if the maturity of the instrument increases.

According to the Preferred Habitat Theory, it is not necessary that the liquidity premium should increase at a uniform rate with maturity.

Statements (a), (b), (c), and (d) are true, and statement (e) is not true. Hence (e) is the answer.

11. Answer : (e)

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Reason : Runaway gaps occur when prices are on a rapid uptrend or downtrend. They generally occur almost halfway through a trend.

A series of runaway gaps indicate that an exhaustion gap is round the corner

Exhaustion gaps represent gaps occurring before a trend ends, or gaps that precede the last leg of a bullish or bearish trend. An exhaustion gap is treated as a sign of consolidation.

Islands refer to the formation of an isolated price pattern, usually within a narrow range, at the end of a price trend, the island is separated by an exhaustion gap and a breakaway gap.

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

12. Answer : (d)

[<TOP>](#)

Reason : Given the maturity, for equal fixed increases and decreases in the YTM, price movements are not symmetrical.

A change in a YTM affects the bonds with a higher YTM more than it affects the bonds with a lower YTM.

For a given difference between YTM and coupon rate of the bonds, the longer the term to maturity, the greater will be the change in the price with change in YTM.

The increase in the price of a bond associated with the changes in the interest rates will be at a diminishing rate as the term to maturity increases.

For a given change in a bond's YTM, the percentage price change will be higher for low coupon bonds than for high coupon bonds.

Thus statements (a), (b), (c) and (e) are false and statement (d) is true. Hence (d) is the answer.

13. Answer : (e)

[<TOP>](#)

Reason : An ETF will primarily invest in the securities of companies that are included in a selected market index.

The NAV of the ETF is equal to a fraction of the value of the underlying index.

ETFs can be bought or sold on a daily basis like stocks.

Hence (e) is the answer.

14. Answer : (d) [< TOP >](#)

Reason : Weak form of efficiency assert that stock prices fully reflect all historical price information. Runs test is used to test the weak form of EMH.

Super strong form of efficiency Stock prices fully reflect all relevant information including insider information.

Semi-strong form of efficiency implies that market prices reflect all publicly available information concerning past trading as well as fundamental aspects of the firm. Hence stock prices are not predictable using the publicly available information.

Relationship between the historical P/E ratios and risk-adjusted market performance is evidence against the semi-strong form of market efficiency.

Hence (d) is the answer.

15. Answer : (d) [< TOP >](#)

Reason : A moving average represents a smoothened trend and therefore act as a support/resistance line. All other statements are true with respect to moving average.

Therefore, option (d) is the correct answer.

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

Reason : The Earnings Per Share (EPS) is given by the following formula

$$\text{EPS} = \frac{\left[r(1 + P / NW) + \frac{D}{NW} (r - i) \right] (1 - T) - dP}{N}$$

This suggests that if EPS has increased, debt to networth ratio cannot decline as EPS is positively related to this ratio. Other arguments support the statement as can be seen from the formula. Hence the correct answer is (b).

17. Answer : (d) [< TOP >](#)

Reason : Relative Strength Index (RSI) = $100 - \frac{100}{1 + RS}$

Where,

$$RS = \frac{\text{Average of stock's up closes}}{\text{Average of stock's down closes}}$$

$$100 - \frac{100}{1 + RS}$$

$$RS = \frac{(460.00 + 473.85 + 463.00 + 464.90)/4}{(455.10 + 457.20 + 451.65 + 449.60)/4} = \frac{465.4375}{453.3875} = 1.0266$$

$$RSI = 100 - \frac{100}{1 + 1.0266} = 100 - 49.34 = 50.66$$

Hence (d) is the answer.

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

Reason : Initial margin = Option premium + 0.2 (stock's market price)
 = (5 x 100 x 3.50) + (0.2 x 57 x 100 x 5)
 = 1,750 + 5,700
 = Rs.7,450

Hence (c) is the answer.

19. Answer : (d)

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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:

- i. the coupon of a bond and convexity (when coupon and maturity are constant) are inversely related.
- ii. The maturity of a bond and convexity (when yield and coupon are constant) are directly related.
- iii. 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)

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Reason : Duration of the bond =
$$D = \frac{r_c}{r_d} \times \text{PVIFA}_{(r_d, n)} \times (1+r_d) + \left(1 - \frac{r_c}{r_d}\right) n$$

 r_c = current yield = coupon/price
Price = $120 \times \text{PVIFA}_{(10.5\%, 15)} + 1000 \times \text{PVIF}_{(10.5\%, 15)} = \text{Rs.} 1,110.9$
 $r_c = 0.1080$
 $r_d = 0.105$
Duration = $1.0286 \times 7.3938 + 1.105 \times (1 - 1.0286) \times 15 = 7.13 \text{ years}$

$$\frac{D}{1+y} = \frac{7.13}{1.105} = 6.45 \text{ years}$$

Modified duration (D_{Mod}) = $\frac{D}{1+y} = \frac{7.13}{1.105} = 6.45 \text{ years}$
% change in price = (D_{Mod}) $\times$ change in yield = $6.45 \times 0.015 = 9.675\%$
Hence (e) is the answer.

21. Answer : (e)

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Reason : CIR Model cannot be implemented by regressing cross-sections of bond returns and their durations. This is the disadvantage in this model.

Principal Components Models can be used to analyze the returns of zero-coupon bonds of varying maturities to extract a set of characteristic yield curve shifts, which can be defined at each maturity.

Spot Rate Models can be used to identify factors with the durations of zero-coupon bonds at several points on the yield curve.

Functional Models assume that zero-coupon yield changes are defined continuously in maturity.

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

22. Answer : (c)

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Reason : Expected Earnings Per Share in 2012 = $\text{Rs.} 12.50 \times 1.15^5 \times 1.06 = \text{Rs.} 26.65$

Expected Dividends Per Share in 2012 = $\text{Rs.} 26.65 \times 0.65 = \text{Rs.} 17.32$

Cost of Equity after 2011 = $6.25\% + 1.1 \times 5.5\% = 12.30\%$

$$\frac{\text{Expected DPS in 2012}}{k_e - g} = \frac{17.32}{0.1230 - 0.06} = \text{Rs.} 274.92$$

Expected Price at the End of 2011 =

Hence (c) is the answer.

23. Answer : (d) [<TOP>](#)
Reason : A price rise that is accompanied by expanding volume is not indicative of any trend reversal.
If volumes obtained at a new high are lower, it is an indication of a trend reversal.
A new high reached with a volume that is actually diminishing is a warning to a reversal in price.
A distribution accompanied by increased volume is a bearish factor.
Termination of a bear market is signaled by a selling climax.
Statements (a), (b), (c) and (e) are true, and statement (d) is not true.
Hence (d) is the answer.
24. Answer : (e) [<TOP>](#)
Reason : Economic value added (not Market Value Added) serves as a proxy for a firm's stock performance. Economic Value Added can be applied to capital budgeting decisions. Higher the ratio of Future Growth value to Market value is used for performing sanity test. Market Value Added serves as a measure of firm's external performance. Hence statements (I) is not true and statements (II), (III) and (IV) are true. Hence (e) is the answer.
25. Answer : (d) [<TOP>](#)
Reason : When both entry and exit barriers are high, profit potential is high but is associated with more risk.
Labour agreements, resettlement costs, maintaining capabilities for spare parts, switching costs, etc, are the few fixed costs of exit.
Learning curve and economies of scale are few entry barriers to a firm in a particular industry.
Exit barriers are economic, strategic and emotional factors that drive companies to be in business despite earning low returns.
Hence (d) is the answer.
26. Answer : (b) [<TOP>](#)
Reason : The shares of close-ended funds are not redeemable at their NAV, but these shares are traded in the secondary market at stock exchanges at market prices that may be above or below their NAV.
Open-ended funds can sell unlimited number of shares and keep their fund growing.
The fund units are sold to the public at the Public Offering Price (POP).
Real estate fund is of close-ended type.
Specialized funds envisage to specialize investment in securities of firms of certain industries or specific income producing securities. Such funds carry more risk for lack of diversification approach.
Hence (b) is the answer.
27. Answer : (d) [<TOP>](#)
Reason : All market orders are day orders only and provide immediate liquidity to the market, and the investor is unaware of the price at which the stock will be traded.
Open orders are also known as "good till cancelled" orders.
In a discretionary order, the broker has the discretion to decide whether to buy or sell the security.
A stop order to sell becomes a market order if the market price goes below the spot order price.
In a stop limit order to buy, the investor can specify the maximum price that he is ready to pay for the stock.
Hence (d) is the answer.

28. Answer : (e)

[<TOP>](#)

Reason : According to the Principle of Highest and Best Use, a rational owner will try to gain the maximum out of the resources he has.

According to the Principle of Change, price is function of demand and supply and value of property fluctuates with price.

According to the Principle of Marginal Productivity, the value of any factor of production or component of a property can add to or lower the value of the asset.

According to the Principle of Substitution, a rational buyer will not spend more than the amount it is going to cost him if he buys similar property with same utility.

Hence (e) is the answer.

29. Answer : (e)

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Reason : Treatment of research and development expenditure, gratuity liability and depreciation provision affects the profit figure of a company and valuation of inventories also affects the profit and loss account however revaluation of financial investment for treasury operation only affect the balance sheet and hence (e) is the answer.

30. Answer : (d)

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Reason : Detachable warrants are issued with most debentures, like convertible or non-convertible or equity, and are immediately detachable. They are traded in the secondary market as separate instruments.

Puttable warrants confer a right on the investor to sell the warrant back to the company at a fixed price before the expiry of a fixed period thereby limiting the risk.

Wedding warrants are attached to the host debentures and can be exercised only if the host debenture is surrendered.

Naked warrants are issued separately and not as part of a bond or a debenture issue. The holder has the option of converting the warrant into debt or equity or some other asset of the issuer.

Statements (I) and (IV) are not true and statements (II) and (III) are true.

Hence (d) is the answer.

Section B : Problems

1. a. The price P of the bond is equal to the sum of its discounted cash flows and given by the following formula

$$P = \frac{8}{(1+5\%)} + \frac{8}{(1+5.5\%)^2} + \frac{8.5}{(1+5.75\%)^3} + \frac{8.5}{(1+5.9\%)^4} + \frac{109}{(1+6\%)^5}$$

$$= \text{Rs.}110.20$$

YTM on this bond:

$$110.20 = \frac{8}{(1+r)} + \frac{8}{(1+r)^2} + \frac{8.5}{(1+r)^3} + \frac{8.5}{(1+r)^4} + \frac{109}{(1+r)^5}$$

By trial and error, $r = 5.95\%$

If the yield curve rises by 50 basis points, i.e., by 0.5%, price of the bond:

$$P = \frac{8}{(1+5.5\%)} + \frac{8}{(1+6\%)^2} + \frac{8.5}{(1+6.25\%)^3} + \frac{8.5}{(1+6.4\%)^4} + \frac{109}{(1+6.5\%)^5}$$

$$= \text{Rs.}107.98$$

YTM on this bond:

$$107.98 = \frac{8}{(1+r)} + \frac{8}{(1+r)^2} + \frac{8.5}{(1+r)^3} + \frac{8.5}{(1+r)^4} + \frac{109}{(1+r)^5}$$

By trial and error, $r = 6.28\%$.

Impact of this rate rise would cause a loss to the bond holder in both absolute and relative terms:

$$\text{Absolute Loss} = \text{Rs.}107.98 - \text{Rs.}110.20 = -\text{Rs.}2.22$$

$$\text{Relative Loss} = \frac{-2.22}{110.20} \times 100 = -2.014\%$$

- b. Annual Rate of Return for the bond holder, if he reinvests the coupons in the market:

- After one year, he receives Rs.8.00, which he can reinvest for 4 years at the 4-year zero-coupon rate to obtain on the maturity date of the bond.

$$8 \times (1 + 5.9\%)^4 = \text{Rs.}10.06$$

- After two years, he receives Rs.8.00, which he can reinvest for 3 years at the 3-year zero-coupon rate to obtain on the maturity date of the bond.

$$8 \times (1 + 5.75\%)^3 = \text{Rs.}9.46$$

- After three years, he receives Rs.8.50, which he can reinvest for 2 years at the 2-year zero-coupon rate to obtain on the maturity date of the bond.

$$8.5 \times (1 + 5.5\%)^2 = \text{Rs.}9.46$$

- After four years, he receives Rs.8.50, which he can reinvest for 1 year at the 1-year zero-coupon rate to obtain on the maturity date of the bond.

$$8.5 \times (1 + 5\%) = \text{Rs.}8.925$$

- After five years, he receives the final cash flow equal to Rs.109.

The bond holder finally receives Rs.146.905 five years later, i.e.,

$$10.06 + 9.46 + 9.46 + 8.925 + 109 = \text{Rs.}146.905.$$

$$\text{Annual rate of return} = \left(\frac{146.905}{110.20} \right)^{1/5} - 1 = 5.918\%$$

- c. The 1-year zero coupon is purchased at (Rs.100/1.05) and will be redeemed at par

The 2-year zero coupon bond has been purchased at (Rs.100/1.055²) and will be sold at (Rs.100/1.0525)

The 3-year zero coupon bond has been purchased at (Rs.100/1.0575³) and will be sold at (Rs.100/1.0575²)

Now,

$$\text{Return on 1-year zero coupon bond} = \frac{100 - 95.23}{95.23} = 5.00\%$$

$$\text{Return on 2-year zero coupon bond} = \frac{95.012 - 89.845}{89.845} = 5.75\%$$

$$\text{Return on 3-year zero coupon bond} = \frac{89.421 - 84.559}{84.559} = 5.75\%$$

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2. Value of the stock = PV of FCFE in high growth phase + PV of FCFE in transition phase + PV of terminal price at the end of transition period.

FCFE = Earnings – (Capital Expenditure – Depreciation) (1 – b) – (Change in working capital) (1-b)

Where, b = debt ratio

High Growth Period					
	1	2	3	4	5
Year	2006	2007	2008	2009	2010
Earnings	1.8	2.16	2.59	3.11	3.73
Cap Exp - Depreciation (a)	0.26	0.32	0.38	0.46	0.55
Change in working capital (b)	1.03	1.23	1.48	1.77	2.13
(c) = (a) + (b)	1.294	1.5468	1.86016	2.226192	2.67743
(c) (1-B)	1.16	1.39	1.67	2.00	2.41
FCFE	0.64	0.77	0.92	1.11	1.32
PV Factor	1.14925	1.14925	1.14925	1.14925	1.14925
PV	0.55	0.58	0.60	0.63	0.66

Transition Period					Stable growth
	6	7	8	9	10
Year	2011	2012	2013	2014	2015
Growth rate	17%	14%	11%	8%	5%
Earnings	4.36	4.98	5.52	5.96	6.26
Cap Exp - Depreciation (a)	0.64	0.73	0.81	0.88	0.92
Change in working capital (b)	2.17	2.09	1.87	1.51	1.02
(c) = (a) + (b)	2.81	2.82	2.68	2.39	1.94
(c) (1-B)	2.53	2.54	2.42	2.15	1.75
FCFE	1.83	2.43	3.11	3.81	4.51
beta	1.38	1.31	1.24	1.17	1.1
Cost of equity	1.1447	1.14015	1.1356	1.13105	1.1265
PV of FCFE	0.80	0.93	1.05	1.13	

FCFE in terminal year	Rs.4.51
Terminal Value at the end of 2014*	Rs.58.95
PV of Terminal Value (a)	Rs.17.54
Cost of equity	12.65%
Total of cash flow of growth phase (b)	Rs.3.02
Total of cash flow of transition phase (c)	Rs.3.91

Value of the stock (a+b+c)	Rs.24.47
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*Terminal value at the end of year 2014 = $4.51/(0.1265-0.05) = 58.95$

*PV of terminal value = $58.95/(1.14925)^5 / 1.1447/1.1402/1.1356/1.1311 = \text{Rs.}17.54$

***Working note:**

Computation of Change in working capital:

Year	Revenue Per Share	working capital (0.65 x Revenue)	Change in W.C
2005	7.89	5.13	
2006	9.47	6.15	1.03
2007	11.36	7.39	1.23
2008	13.63	8.86	1.48
2009	16.36	10.63	1.77
2010	19.63	12.76	2.13
2011	22.97	14.93	2.17
2012	26.19	17.02	2.09
2013	29.07	18.89	1.87
2014	31.39	20.40	1.51
2015	32.96	21.43	1.02

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3.

Systematic risk = $\beta_i^2 \sigma_m^2$

$$\beta_i^2 = \frac{\text{Systematic risk}}{\sigma_m^2}$$

$$\beta_A^2 = \frac{12}{9}$$

$$\beta_A = 1.15$$

Similarly,

$$\beta_B^2 = \frac{5}{9} \Rightarrow \beta_B = 0.75$$

$$\beta_C^2 = \frac{18}{9} \Rightarrow \beta_B = 1.41$$

According to the CAPM,

$$R_i = R_f + \beta (R_m - R_f)$$

$$R_B = R_f + 0.75 (R_m - R_f) \dots\dots\dots (1)$$

$$R_C = R_f + 1.41 (R_m - R_f) \dots\dots\dots (2)$$

(2) – (1) will give

$$14 - 9 = (1.41 - 0.75) (R_m - R_f)$$

$$(R_m - R_f) = 7.58\%$$

Substituting in (1),

$$9 = R_f + 0.75 \times 7.58$$

$$R_f = 3.31\%$$

$$R_A = 3.31 + 1.15 (7.58) = 12.03\%$$

Again Systematic risk can be expressed as $\rho_{im}^2 \sigma_i^2$

$$\sigma_B^2 = \frac{\text{Systematic risk}}{\rho_{im}^2}$$

$$= \frac{5}{(1.05)^2} = \frac{5}{1.1025} = 4.535$$

$$\sigma_B = 2.13\%$$

$$\sigma_C^2 = \frac{18}{(1.2)^2} = \frac{18}{1.44} = 12.5$$

$$\sigma_C = 3.54\%$$

$$\rho_{im} = \frac{\text{Systematic risk}}{\sigma_{im}^2} = \frac{12}{14} = 0.9$$

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4. a. Price = $1.12 + \frac{9.5}{1.12^2} + \frac{9.5}{1.12^3} + \frac{9.5}{1.12^4} + \frac{109.5}{1.12^5} = 90.98 \cong \text{Rs.91}$
- b. Because the bond is trading at par Rs.100, the difference in price between Rs.100 and Rs.91 (calculated above in a) must be due to the warrants. With 50 warrants per Rs.10000 nominal value, the implicit cost per warrant is $10000 \times (100\% - 91\%) / 50 = \text{Rs.18}$. This means that 1 call on the underlying stock with strike 200 costs Rs.90 (5 warrants are needed). Since the stock is trading at 320, the intrinsic value of the call is 120. Therefore the warrants seem to be undervalued.
- The reasons for the undervaluation:
1. The yield of 12% is wrong and should be higher.
 2. The warrants may be of European style and in between the company may have paid large dividend and therefore the price of the warrant already discounts.
 - c. As the price volatility of the underlying share increases, the premium of the warrant also increases. Because the investors are ready to pay extra for such warrants due to speculative reasons, their expectancy of increase in prices of underlying stock also increases, which lures them to purchase such warrants.

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5. First we should find out abnormal return by deducting the actual return from the expected return

Arun Motors Ltd:

Period	Actual return (r_{At})	Market return (r_{Mt})	Expected return (%) $1.4 + 0.75(r_{mt})$	Abnormal return $r_{At} - r_{mt}$
3	12.14	11.45	9.9875	2.1525
2	12.52	11.85	10.2875	2.2325
1	12.05	12	10.4	1.65
0	11.89	12.25	10.5875	1.3025
1	12.63	12.6	10.85	1.78
2	12.16	11.95	10.3625	1.7975
3	12.84	11.2	9.8	3.04

Bimal Infotech Ltd:

Period	Actual return (r_{Bt})	Market return (r_{Mt})	Expected return (%) $1.59 + 1.23(r_{mt})$	Abnormal return $r_{Bt} - r_{mt}$
3	12.56	11.45	15.6735	-3.1135
2	12.79	11.85	16.1655	-3.3755
1	13.04	12	16.35	-3.31
0	12.43	12.25	16.6575	-4.2275
1	13.62	12.6	17.088	-3.468

2	13.16	11.95	16.2885	-3.1285
3	13.32	11.2	15.366	-2.046

Celine Airlines Ltd:

Period	Actual return (r_{Ct})	Market return (r_{Mt})	Expected return (%) $1.92+1.40(r_{mt})$	Abnormal return $r_{Ct} - r_{mt}$
3	13.05	11.45	17.95	-4.9
2	13.42	11.85	18.51	-5.09
1	13.58	12	18.72	-5.14
0	13.25	12.25	19.07	-5.82
1	14.42	12.6	19.56	-5.14
2	14.2	11.95	18.65	-4.45
3	14.45	11.2	17.6	-3.15

We will now estimate the average abnormal return to each of the months before and after the dividend was announced.

Third month before the announcement of dividend

$$AAR_{(-3)} = \frac{1}{3}(2.125 - 3.115 - 4.9) = -1.954\%$$

Second month before the announcement of dividend

$$AAR_{(-2)} = \frac{1}{3}(2.2325 - 3.3755 - 5.09) = -2.078\%$$

First month before the announcement of dividend

$$AAR_{(-1)} = \frac{1}{3}(1.65 - 3.31 - 5.14) = -2.267\%$$

Month during which the dividend was announced

$$AAR_{(0)} = \frac{1}{3}(1.3025 - 4.2275 - 5.82) = -2.915\%$$

First month after the announcement of dividend

$$AAR_{(1)} = \frac{1}{3}(1.78 - 3.468 - 5.14) = -2.276\%$$

Second month after the announcement of dividend

$$AAR_{(2)} = \frac{1}{3}(1.7975 - 3.1285 - 4.45) = -1.927\%$$

Third month after the announcement of dividend

$$AAR_{(3)} = \frac{1}{3}(3.04 - 2.046 - 3.15) = -0.719\%$$

Now we will compute the cumulative Average Abnormal returns (CAAR) for the period of three months before and after the announcement of dividend.

$$CAAR = (-1.954 - 2.078 - 2.267 - 2.915 - 2.276 - 1.927 - 0.719) = -14.135\%$$

As the value of CAAR is not close to zero, we conclude that market is not efficient in the semi-strong form.

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6. Duration of outflows:

Therefore duration can be calculated for the following liability as under:

YTM = 13% (6.5% for semi-annual)

No.	Cash outflow	PVIF @ 6.5%	
(1)	(2)	(3)	(1)*(3)
5	25000	18247.02	91235.10
6	25000	17133.35	102800.12
7	25000	16087.66	112613.59
8	25000	15105.78	120846.24
9	25000	14183.83	127654.48
10	25000	13318.15	133181.51
11	25000	12505.31	137558.37
12	120000	56361.94	676343.31
		162943.04	1502232.71

Therefore, Duration = 1502232.71/162943.04 = 9.22 i.e. 4.61 years

Duration of Inflows:

LML bond:

Firstly, we have to calculate the YTM for the bond

$$106.94 = 6 \text{ PVIFA}(12, i) + 105 \text{ PVIF}(12, i)$$

By trial and error, we get $i = 5.5\%$

Period	Cash outflow	PVIF @ 5.5%	
(1)	(2)	(3)	(1)*(3)
1	6	5.69	5.69
2	6	5.39	10.78
3	6	5.11	15.33
4	6	4.84	19.37
5	6	4.59	22.95
6	6	4.35	26.11
7	6	4.12	28.87
8	6	3.91	31.28
9	6	3.71	33.35
10	6	3.51	35.13
11	6	3.33	36.62
12	111	58.38	700.61
		106.94	966.09

Therefore, Duration = 966.09/106.94 = 9.03 i.e. 4.52 years

GOG bond:

Duration for GOG bond will be same as its maturity as it is zero coupon bond. Therefore, duration of GOG is 6 years.

Now, to immunize the payments, duration of investment = duration of liabilities.

Let proportion of funds to be invested in LML bond be x .

Then, the duration of investment = $x \times 4.52 + (1 - x) 6$

As duration of investment = Duration of liabilities

$$4.52x - 6x + 6 = 4.61$$

Therefore, $x = 94\%$

Proportion of funds in LML bond = 94% and GOG bond = 6%

Section C: Applied Theory

7. Differences in Trading Procedures

Trading procedures differ across different equity markets according to their operational set-up and legal obligations. The most important differences are given below.

Cash Vs Forward Markets

Cash settlement is very popular in most of the stock markets, where transactions should be settled within a short span of time. Margin trading is also available in these markets. The United States, Canada, Japan and Switzerland are good examples of the cash markets. Margin trading is an integral part of these markets.

Forward stock market gives a good base for levered stock trading. The major forward markets are London, Paris and Rio de Janeiro. The Paris bourses provide an excellent example of forward market. In this market, all transactions are settled at the end of a fixed period, which can be a month or a fortnight. For example, in Paris bourses, all the transactions are settled at the end of the month on the settlement day, whereas in London bourses the deals are settled in a fortnight. So, we can say that forward market follows periodic settlement system. In most forward markets, a deposit is required to guarantee an open position. The main feature of this market is that the price of the stocks remains fixed even if it changes during the settlement period. Settling of the account after a certain fixed period simplifies the trading procedure, but it also attracts opportunity for short-term speculation. On the Paris bourses, both smaller stocks and bonds are traded on cash basis.

Call Vs Continuous Quotation

A continuous market provides uninterrupted trading throughout the day and market makers ensure the required liquidity for this continuous trading. New York Stock Exchange (NYSE) is a good example of this kind of trading. In NYSE, market maker quotes both the bid and ask price (offer price). These two-way quotes establish the firm responsibility of a market maker, because normal investors transact with the dealers who provide the most favorable price to them. The market makers will adjust their quotation according to the demand and supply of the stock. These types of the markets are often called dealer markets or price driven markets.

In auction markets, active market makers do not exist and demand and supply of the securities is directly related to the transaction price. The trading of the stocks will not be on a continuous basis and any stock can be traded only once or a few times per day. This type of market is called call or fixing market, in which orders are batched together until the auction and are executed at a single price that matches the demand and supply.

Two major types of orders are submitted in an auction market, i.e., market order and limit order. In market order, customer will accept the price fixed in the auction. On the other hand, in limit order system, the price is determined by the maximum price which a customer is willing to give or the minimum price at which the customer is willing to sell the share. When the bourses official writes a higher price, some limit sell orders will be removed from the supply of stocks and some limit buy orders will be added to the demand for shares. This process results in an equilibrium price. In Tokyo, the call auction system determines the morning and afternoon starting price. A call auction market is also called order driven market because all traders openly post their orders and the transaction price is derived through equilibrating the demand and supply of the stock.

Microstructure of the Market

All stock exchanges in the world are using the electronic technology to automate the trading process. The main purpose of any trading procedure is to discover the best price for investors. The convenient system of trading helps in getting a fair price without providing any favorable term to any counterparty.

Again a good trading procedure helps in reducing the transaction cost and provides a transparent and liquid market. There are several controversial issues in the microstructure of stock trading system. For example, there is a lot of disagreement on how to measure transaction cost. Sometimes, it is called the difference between the price, including commissions and the price of the previous market. In other words, it can be taken as a sum of commissions, taxes and other market impacts.

Price-Driven vs Order-Driven Systems

Computerized trading systems basically follow two different approaches depending on the dominance of either the dealers or brokers. The London Stock Exchanges Automated Quotation (LSEAQ) and the National Association of Securities Dealers Automated Quotation (NASDAQ) are price-driven or quote-driven systems. In this kind of trading system, there are no automatic quotes because the market maker does not know the form of the final

contract. The quote-driven system allows the market maker to buy a limit order at the bid price and sell it at the offer price.

The Paris, Tokyo and most of the European and Asian markets are order-driven markets. The limit order book is the heart of these trading systems. After assessing the standing orders, a trader can judge the nature of the trade. The NYSE follows a mixture of these two systems. In NYSE, the limit order is in private knowledge of the specialist, and the brokers are likely to keep their limit orders a secret and keep them with their floor brokers to trade in the most suitable manner. In all cases, a limit order gives a free trading option to other market participants. In an order-driven market, it is the trader who submits the order but in a price-driven market, the dealer posts a firm quote and provides free option.

Information Emission And Transparency

Transparency in the market is of utmost importance because it gives the market a kind of stability and proper information about the past and the recent trades. Automation enhances the transparency in the market because a large amount of information is available to the public. The New York Stock Exchange is less transparent, as the limit order book is a private information and cannot be revealed to everybody. Some traders trade on the basis of private information, while some trade with the help of the publicly available information. The presence of the informed traders can create trouble for the normal traders. A well informed trader can pick-up some shares after getting some private information. On the London market, dealers quote for big transactions and the well informed investors can trade with several traders before any of them comes to know about the transaction. Informed traders do not want to disclose the information.

Market Fragmentation

Liberalization and automation of the equity markets have increased the competition among domestic markets as well as the international markets. For example, the London Stock Exchange accounted for 20% to 50% of the total volume of trades in French, Dutch and German shares. Various overseas stocks are traded on the floor of the NYSE. Buying futures on some index is sometimes an alternative to buying a diversified portfolio of shares and this causes fragmentation in the market. Domestic markets are protecting their interest by imposing certain rules to off-exchange trades. The obvious presence of fragmentation and competition has improved the efficiency of the markets.

Internationalization

Development of the global equity market is the first step in the internationalization of equity trading. Many developed countries have opened overseas branches to cater to their foreign investors. The US, Britain, Japan are the main countries to attract the foreign investors. Some stock markets believe that they can safeguard their global interest by establishing links with other markets. This pattern is most famous among the futures and options market. The NASDAQ system is available to the investors in England and Singapore. The international stock exchange in London and the NASDAQ have agreed not to enforce competition among themselves by ignoring the quotes and trading for common shares. Automation of trading procedure has allowed some stock exchanges to attract a significant amount of the foreign company shares.

Anonymity and Reputation

Some investors and traders would prefer to maintain anonymity to get a better price in their deal. On the other hand, market makers and brokers would like to build a reputation for their skills. They try to advertise their competency and skills to attract more clients. In NASDAQ, for small orders, brokers can provide their choice for the particular market makers. But this is a dangerous practice since it weakens the dealer's incentive to publish the best price.

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8. Key Characteristics In An Industry Analysis

The most important of the characteristics that are to be evaluated in an Industry Analysis can be enumerated as given below:

1. Past sales and earnings performance.
2. Permanence of the industry.
3. The attitude of the government towards the industry.
4. Labor conditions within the industry.
5. The competitive conditions as reflected by the existence of the entry barriers and

6. The stock prices of the firms in the industry relative to their earnings.

Past Sales and Earnings Performance

For an analyst, the past sales and earnings performance of the firm form a crucial input in forecasting future trends. This is not to say that the firm is going to repeat the same performance again. Rather, the analyst is more interested in examining the contribution of the various factors in the past so that the relevance of these factors individually and relatively can be properly evaluated under present conditions.

In any firm, sales and the earnings play an important role. These variables will exhibit a degree of consistency only when the firm has weathered a variety of economic conditions. The analyst from the observation of these variables will be able to judge the stability of the performance in terms of sales and earnings as well as the growth rates. Another crucial factor is that of the relationship between the sales and the fixed costs. The more the fixed costs, the higher will be the break even point and higher will be the sales volume to be achieved.

Permanence

By permanence, we understand the products and the technology of a particular industry not becoming obsolete in a short span of time. If the industry is not permanent, then investing in that industry altogether becomes a losing proposition. In some of the cases a product with additional features manufactured by employing superior technology makes the existing product totally irrelevant or at least results in the manufacturing process becoming a commercially enviable proposition.

In this age of rapid technological developments, this factor plays a crucial role in Industry Analysis. The Government's role is also an important factor affecting the permanence of the industry.

The Attitude of the Government towards the Industry

It is imperative for an Analyst that he should be well aware of the various Government policies and regulations with reference to an industry in which he is going to invest. The government policies like deregulating an industry by allowing foreign investment, imposing high tariffs on imports and restrictive legislation have a bearing on their performance. Some of the legal restrictions result in the profits being very low for a particular industry. Thus an analyst, for that matter an investor also should be thorough with various government regulations and their implications and should be able to predict, at least broadly, the changes likely to take place in the regulations in the near future.

Labor Conditions

This is an important factor to be considered in industries which are labor intensive. An analyst should examine the various provisions of the labor laws and also go into the possible reasons that may halt the production process and its fallout on the profits of the industry. In case of a prolonged strike, a labor intensive firm will not only lose its customers and goodwill but also may not be able to cover its fixed costs in certain cases.

Competitive Conditions

While analyzing this situation, the three general types of barriers that an analyst should concentrate on, are

1. Existence of product differentiation
2. Absolute cost advantages and
3. Advantages rising from economies of scale.

The existence of the first barrier assures that a new entrant will not be able to charge as much as the existing firms. Also he has to spend large amounts of money on advertising to capture an acceptable share of the market as this situation is usually found in cases where the customers exhibit a high degree of brand loyalty. By absolute cost advantages, we understand that the existing firms are capable of producing and distributing the products at lower costs than the new entrants irrespective of the volume produced. As a result, they enjoy wider profit margins. This may be due to the fact that the existing firms may have exclusive patents, own the resources or superior management skills that are not available to the new entrants.

Economies of scale are usually realized when the production levels are quite high. A new entrant in this case also has to garner a significant market share so that he can avail the benefits from economies of scale. If he fails to do so, he will be able to compete with the prices offered by the existing players.

Industry Share Prices Relative to its Earnings

In addition to the various factors we have been looking at, the analyst also has to look at the present share prices. In this case under priced share would be the best bet. Also he should examine the fact that the share prices are not high due to the overzealous nature of the investors to acquire the shares of the firms in a new industry. Usually the

shares of these companies experience high fluctuations depending on the crowd behavior.

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