

Question Paper Security Analysis – I (211): January 2005

• 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/are true?
- I. A bond's price moves inversely proportional to its yield to maturity
- II. The percentage price change due to a change in yield to maturity increases at a diminishing rate as bond's maturity time decreases
- III. Given the maturity, the change in bond price will be greater with a decrease in bond's YTM than the change in bond price with an equal increase in the bond's YTM.
- (a) Only (I) above (b) Only (II) above
(c) Both (I) and (II) above (d) Both (I) and (III) above
(e) All (I), (II) and (III) above.

2. Consider the following data about two securities A and B: [< Answer >](#)

	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) $802.40(\%)^2$.
3. The required rate of return of a company is 20%. It has paid a dividend of Rs.2.50 for the year 2003-2004, if the stock is currently trading at its intrinsic value of Rs.40, the growth rate in dividend is [< Answer >](#)
(a) 17.28% (b) 13.46% (c) 12.94% (d) 11.06% (e) 10.89%
4. Consider the following information related to a bond: [< Answer >](#)

4. Consider the following information related to a bond: [< Answer >](#)

Par Value	Rs. 1,000
Time to Maturity	20 years
Coupon rate (Interest payable annually)	10%
Current Market Price	Rs. 851
Yield to Maturity (YTM)	12%

Other things remaining the same, if the bond starts paying interest semi-annually,

then the change in the market price of the bond will be approximately

5. If the current one year interest rate is 25% and the three year interest rate is 22%, then the two year interest rate next year is expected to be
- (a) -0.2% (b) -0.1% (c) +0.1% (d) +0.2% (e) No change.
6. If investors expect the inflation rate to fall, which of following is/are the consequences?
- I. The slope of the SML would decrease
II. The required return on an average stock would decrease
III. The market risk premium would decrease
- (a) Only (I) above (b) Only (II) above
(c) Only (III) above (d) Both (I) and (III) above
(e) All (I), (II) and (III) above.

7. The correlation coefficient of return on stock X with market return is negative. Which of the following [< Answer >](#)

is the implication of the given statement?

- (a) On an average, the returns from stock and market move in opposite directions
- (b) The average risk of stock X is less than the market risk
- (c) The average return of stock X is more than the market return
- (d) Stock X has given an above normal return
- (e) Stock X has given a below normal return.

8. Which of the following is/are **true** according to H-model? [< Answer >](#)

- I. According to the model, if the current growth rate is lower than the normal long run growth rate, the growth rate eventually decreases
 - II. It is assumed, that at H years, the growth rate is exactly half-way between the abnormal growth rate and the normal growth rate
 - III. The intrinsic value of a share according to the model is equal to the value based on the normal growth rate plus premium due to abnormal growth rate.
- (a) Only (I) above
 - (b) Only (II) above
 - (c) Both (I) and (II) above
 - (d) Both (II) and (III) above
 - (e) All (I), (II) and (III) above.

9. Which of the following principles is **true** while analyzing trendline penetrations? [< Answer >](#)

- (a) The lesser the number of peaks/troughs that touch a trendline, the greater is its significance
- (b) The breadth of a trendline indicates whether a penetration is significant or not
- (c) A steep trendline is easily violated by small sideward movements in the price chart, and is not particularly useful in identifying reversals
- (d) Penetration of a steep trendline results in a corrective movement after which the new trend starts
- (e) When the peaks of rallies penetrate, the trend line and then return, the recurrence of this tendency indicates that the trend “obeys” the trendline.

10. According to the Capital Asset Pricing Model (CAPM), the expected return of a well diversified portfolio with a beta of 1.0 and positive ex-ante alpha (α) is [< Answer >](#)

- (a) The risk-free rate, r_f
- (b) $\beta (r_m - r_f)$
- (c) Between r_m and r_f
- (d) The expected return on the market, r_m
- (e) $r_m + \alpha$.

11. A portfolio has 40% of its fund invested in security A and the balance in security B. The standard deviation of security A's return is 10% and its correlation coefficient with security B's return is 0.5. If the variance of the portfolio is 133(%)². The standard deviation of security B's return is [< Answer >](#)

- (a) 10%
- (b) 12%
- (c) 15%
- (d) 18%
- (e) 20%.

12. Consider the following data: [< Answer >](#)

Ratios	2003	2004
PAT/PBT	0.6250	0.6475
PBT/NS (%)	12.50	12.60
NS/TA	1.50	1.72
TA/NW	2.25	2.90
ROE (%)	26.37	41.34

The rise in ROE has taken place in 2004 due to

- I. Increase in profit margin.
 - II. Increase in leverage.
 - III. Lower tax efficiency.
 - IV. Increase in asset turnover.
- (a) Both (I) and (II) above
 - (b) Both (I) and (III) above
 - (c) Both (II) and (IV) above
 - (d) (I), (II), and (IV) above
 - (e) (I), (II) and (III) above.

13. Which of the following is/are **not** a clear bearish signal? [< Answer >](#)

- I. Head & Shoulders
 - II. Double bottom
 - III. Triangle
- (a) Only (I) above
 - (b) Only (II) above
 - (c) Only (III) above
 - (d) Both (I) and (II) above
 - (e) Both (II) and (III) above.

14. Closing prices of the stock of First Global Ltd. are given below: [< Answer >](#)

Day	Closing Price (Rs.)
1	230.50
2	235.50
3	222.10
4	225.10
5	230.10

The relative strength of the stock is

- (a) 0.9952 (b) 1.0366 (c) 1.0925 (d) 1.1125 (e) 1.1175.
15. Which of the following statement(s) is/are **true** concerning all the three forms of the efficient market hypothesis? [< Answer >](#)

- I. Equilibrium rate of return will prevail.
 II. Securities of firms sell at their fair value.
 III. Investors cannot earn a positive return.

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

16. Which of the following statement(s) is/are **true** as per fundamental analysis and assumptions of constant growth dividend capitalization model? [< Answer >](#)

- (I) A stock that sells for less than book value is undervalued
 (II) If a company's return to equity drops, its price/book value ratio will drop more than proportionately
 (III) A combination of a low price/book value ratio and a high expected return on equity suggests that a stock is undervalued

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

17. An European call option can be exercised [< Answer >](#)

- (I) Only on the expiration date
 (II) Any time in the future
 (III) If the price of the underlying asset declines below the exercise price

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

18. An entrepreneur is planning an investment in electronic goods industry. The relevant data is as under: [< Answer >](#)

Estimated industry sales	Rs.4000 crore
Estimated market share of the company	3%
Estimated net profit margin of the industry	17%
Estimated operating profit margin of the company	25%
Estimated net profit margin of the company	15%
Number of outstanding shares of the company	3 crore

Assuming no outstanding preference shares, the forecast value of the EPS for the company will be

- (a) Rs.3.2 (b) Rs.6.0 (c) Rs.6.8 (d) Rs.10.0 (e) Rs.6.2.

19. Which of the following is most desirable, considering the view point of the industry profits? [< Answer >](#)

- (a) High entry barrier and high exit barrier
 (b) High entry barrier and low exit barrier
 (c) Low entry barrier and low exit barrier
 (d) Low entry barrier and high exit barrier
 (e) None of the above.

20. Which of the following statements is/are **true** with regard to a depository? [< Answer >](#)

- (I) Filling up transfer deeds and lodging the same with the company for transfer is not necessary
 (II) There would not be any bad deliveries
 (III) Exemption from paying stamp duty on transfer of debentures
 (IV) Faster payment on sales of shares
- (a) Only (I) above (b) Only (II) above
 (c) Only (I) and (II) above (d) (I), (III) and (IV) above
 (e) All (I), (II), (III) and (IV) above.
21. Which of the following statements is/are **false** with regard to Elliott Wave Theory? [< Answer >](#)
- (I) It was originally applied to Dow Jones industrial averages.
 (II) 3rd wave is always the shortest in five wave advance.
 (III) Wave A confirms the end of uptrend.
- (a) Only (I) above (b) Only (II) above
 (c) Only (III) above (d) Both (I) and (II) above
 (e) Both (II) and (III) above.
22. An option writer writes a 6-m naked call option on a stock at a premium of Rs.3 and the strike price of Rs.150. The prevailing market price of the stock is Rs.130. If, on the expiration day, the price of the stock is Rs.140, then the profit/loss to the option writer will be [< Answer >](#)
- (a) Rs. -10 (b) Rs. 7 (c) Rs. 3 (d) Rs. 10 (e) Rs. 13.
23. The required return on a stock is 16% and the expected return on the market is 8%. Suddenly due to economic conditions, the expected return on the market increases to 12% and the new required rate of return on the stock increases to 20%. If the stock is currently in equilibrium and other things remaining the same, what would be beta of the stock? [< Answer >](#)
- (a) 1.00 (b) 0.80 (c) 0.60 (d) 0.50 (e) 0.25.
24. The number of unique covariance terms required to be calculated, in order to calculate the risk of portfolio of 11 securities by the Markowitz model is [< Answer >](#)
- (a) 25 (b) 35 (c) 37 (d) 42 (e) 55.
25. Which of the following is/are **true** if a firm has a required rate of return equal to the ROE? [< Answer >](#)
- I. The amount of earnings retained by the firm does not affect market price or the P/E.
 II. The firm can increase market price and P/E by increasing the growth rate.
 III. The P/E ratio is inversely proportional to the ROE of the firm.
- (a) Only (I) above (b) Both (I) and (II) above
 (c) Both (I) and (III) above (d) Both (II) and (III) above
 (e) All (I), (II) and (III) above.
26. Margin in a futures contract depends on the price volatility of the underlying asset. The margin requirement can be estimated by calculating [< Answer >](#)
- I. Average daily absolute change in the value of futures contract
 II. Average number of transactions of the futures contract
 III. Standard deviation of the absolute change in the value of futures contract
 IV. Coefficient of variation of the absolute change in the value of futures contract.
- (a) Only (I) above (b) Only (III) above
 (c) Only (IV) above (d) Both (II) and (IV) above
 (e) Both (I) and (III) above.
27. The duration for a bond paying semi-annual coupon is 6.78 years for a maturity of 11 years. If the YTM of the bond is 13% with a coupon rate of 12% and face value is Rs.100, the modified duration of the bond is [< Answer >](#)
- (a) 6.37 years (b) 6.28 years (c) 6.14 years (d) 5.82 years (e) 4.86 years.
28. A company has issued warrants which entitle the investors to purchase 100 shares of the company at Rs.65 each. The current market price of the stock is Rs.40 per share and the warrants are trading at Rs.20 each. The warrant premium is [< Answer >](#)
- (a) Rs.20 (b) Rs.25 (c) Rs.40 (d) Rs.50 (e) Rs.60.
29. Consider the following data of JM Mutual Fund (Income plan): [< Answer >](#)

	Rs. in crore
Value of investments	2084.52
Receivables	162.88
Accrued income	47.74
Other current assets	573.23
Liabilities	488.56
Accrued expenses	112.92

If the number of outstanding units is 160 crore and sales charge is 2.5% on the NAV, the public offering price is

- (a) Rs.14.17 (b) Rs.14.53 (c) Rs.15.58 (d) Rs.15.98 (e) Rs.21.69.

30. A convertible bond with a face value of Rs.1,000 had been issued at Rs.1,200 with a coupon rate of 10%. The conversion rate is 20 shares per bond. The current market price of the bond is Rs.1,300 and that of stock is Rs.55. The premium over conversion value is [< Answer >](#)

- (a) 9.09% (b) 18.18% (c) 20.00% (d) 23.15% (e) 30.00%.

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 information relating to the returns from two stocks and the market index in different economic scenario:

Scenario	Probability of scenario	Return (%)		
		Stock A	Stock B	Market
Boom	0.25	22.5	25.0	14.0
Slow growth	0.45	12.0	7.5	13.0
Stagnation	0.20	-5.5	5.0	-10.5
Recession	0.10	5.0	5.5	3.5

From the above information, you are **required** to:

- Calculate the proportion of unsystematic risk in the total risk for the two Stocks.
- Determine the Alpha of the two stocks and comment on the same if SML holds good. Assume a risk free rate of interest of 5.5%.

(6 + 3 = 9 marks) < Answer >

2. Following are the yields on zero coupon bonds:

Maturity (Years)	YTM
1	10%
2	11%
3	12%

Assuming that the expectation hypothesis of term structure holds good, you are **required** to

- Calculate the implied one-year forward rates and prices of the zero coupon bonds having a face value of Rs.1,000.
- Calculate the expected yield to maturities and prices of one year and two year zero coupon bonds at the end of first year.
- Calculate expected total return on the two bonds, if you have purchased two-year and three-year zero coupon bonds and held for a period of one year.
- Calculate the current price of a 3-year bond having a face value of Rs.1,000 with a coupon rate of 11%. If you buy this bond at the current price and hold for one year, what is the expected holding period return?

(2 + 2 + 2 + 4 = 10 marks) < Answer >

3. Computronix Ltd. is an established computer hardware manufacturing firm. The EPS of the company last year was Rs.50 and it has recently paid a dividend of Rs.25 per share. Investors expect that the company plans to maintain its dividend payout ratio. The return on equity (ROE) for the company is 20%.

You are **required** to

- Calculate the market price of Computronix Ltd., if the required rate of return for the computer hardware industry is 15%.
- Calculate the intrinsic value of Computronix Ltd., if the increasing competition will decrease the ROE to 15% in the next two years and the retention ratio will decrease to 40% at the end of the second year from now.
- Calculate the rate of return on Computronix stock during the next three years, if the market is unaware of the changed competitive status until the end of year two.

(2 + 3 + 4 = 9 marks) < Answer >

4. An investor writes a naked call option as well as a naked put option on NSE as per the details given under:

Option Type	Stock	Expiring on	Strike Price (Rs.)	Option Premium per share (Rs.)	No. of shares per contract	Current Market Price of stock (Rs.)
Call	A	31 st March 2005	250	12.70	1,400	254.80
Put	B	31 st March 2005	320	8.00	1,100	323.90

Considering the above, you are **required** to calculate the margin to be deposited by the investor in his brokerage account.

(7 marks) < Answer >

5. Robotics Ltd. has recently come out with a partly convertible debentures (PCDs) to part finance its Rs.50 crore capacity expansion programme. As per the terms of this issue, 9% PCDs of Rs.200 each will be issued at par. The convertible part of the debenture (Part A) of Rs.100 will be converted into 2 equity shares of face value Rs.10 after 18 months from the date of allotment. The non-convertible part (Part B) of Rs.100 will be redeemed after 7 years. Interest will be paid semi annually.

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

	March, 2001	March, 2002	March, 2003	March, 2004
EPS (Rs.)	2.50	2.00	2.25	2.40
BONUS (Ratio)		1:2		

Month	Jan 2004	Apr 2004	July 2004	Sep 2004	Dec 2004
Average P/E Ratio	12.0	11.8	11.5	11.0	10.8

You are **required** to advise whether one should subscribe to the issue, if the required rate of return is 10% p.a. compounded semi-annually.

(10 marks) < Answer >

6. The following table summarizes the information about stocks, which have advanced or declined during the period from 2/08/2004 to 13/08/2004:

Day	Advances	Declines
August 2, 2004	338	408
August 3, 2004	312	431
August 4, 2004	342	395
August 5, 2004	601	160
August 6, 2004	280	464
August 9, 2004	427	315
August 10, 2004	444	302
August 11, 2004	130	632
August 12, 2004	191	559
August 13, 2004	392	339

You are **required** to compute the 6-day momentum oscillator for the period August 2, 2004 to August 13, 2004.

(5 marks) < Answer >

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. The first challenge in the investment management process lies in choosing the appropriate investments and designing a unit that will meet the investment objectives of the investor subject to his constraints. Briefly, describe the investment objectives and constraints faced by investors.

(10 marks) [< Answer >](#)

8. Technical Analyst always considers market timing more important factor. Elliott wave theory was originally used by them to major stock market averages, particularly the Dow Jones Industrial average. Discuss the basic tenets of Elliott wave theory and the wave personalities advocated in it.

(10 marks) [< Answer >](#)

END OF SECTION C

END OF QUESTION PAPER

Suggested Answers

Security Analysis-I (211): January 2005

Section A : Basic Concepts

1. Answer : (d) [< TOP >](#)
Reason : According to the bond valuation concept, a bond's price increases with a decrease in ytm and vice-versa. Hence, (I) is true. For equal fixed increases and decreases in the ytm, price movements are not symmetrical. For a given maturity, the bond price changes more with a decrease in ytm than the change in bond price with an equal increase in ytm. Hence, (III) is true and the answer is (d).
As maturity time increases, the percentage price change due to a change in ytm increases at a diminishing rate. Hence, (II) is not true.
2. 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)
3. Answer : (c) [< TOP >](#)
Reason : $P_0 = \frac{D_0(1+g)}{h-g} \Rightarrow 40 = \frac{2.5(1+g)}{0.2-g} \Rightarrow 8 - 40g = 2.5 + 2.5g$
 $\Rightarrow 42.5g = 5.5 \Rightarrow g = 0.1294$ i.e. 12.94%.
4. Answer : (a) [< TOP >](#)
Reason : The equation expressing the relationship between Market Price of the bond and YTM is as follows
 $P_0 = C_0 \times PVIFA_{(k, n)} + F \times PVIF_{(k, n)}$
Substituting the given values in the equation, we get
 $P_0 = 50 \times PVIFA_{(6\%, 40)} + 1000 \times PVIF_{(6\%, 40)}$
 $= 50 \times 15.046 + 1000 \times 0.097 = 849.30$
Therefore, the change in market price = $(849.30 - 851)/851 = -0.199\% = -0.2\%$
Hence the correct answer is (a).
5. Answer : (b) [< TOP >](#)
Reason : According to the expectations theory,
 $1 + r_{0,3} = [(1+r_{01})(1+f_{23})^2]^{1/3}$
or $(1+f_{23}) = \left[\frac{(1+r_{03})^3}{1+r_{01}} \right]^{1/2} = \left[\frac{(1.22)^3}{1.25} \right]^{1/2} = 1.205$
 $f_{23} = 1.205 - 1 = 20.5\%$.
6. Answer : (b) [< TOP >](#)
Reason : The security market line is represented by the equation $R(r_i) = [E(r_m) - r_f] \beta_{im} + r_f$, where, $R(r_i)$ is the required return, r_f = risk free interest rate, $E(r_m) - r_f$ = slope of the line SML. Risk-free rate of return consists of real risk-free rate of interest + inflation rate. The slope of the line represents the market risk premium and is the function of risk aversion of the investors. Thus, when the inflation rate falls or rises risk-free rate of return and required return on the average stock will decrease or increase. Hence, statement II is true. The slope of the SML or the market premium changes with the investors perception of risk. Hence, the statements I and III are not true and the answer is (b)
7. Answer : (a) [< TOP >](#)
Reason : Correlation coefficient between two securities measure the relationship between the securities.

If this coefficient is positive it indicates the returns on the securities move in the same direction and if it is negative it indicates that the returns on the securities move in the opposite direction. In the question it is given that the correlation coefficient of return on a stock with the returns on the market is negative which indicates that the returns on the stock and the market move in the opposite direction. Hence, (a) is correct.

Risk is measured by variance or beta. Hence, statement (b) cannot be deduced from the given statement. As correlation coefficient shows the relationship of movement of returns on the securities nothing can be deduced about the level of returns. Hence, statement (c) is not correct. Whether a stock is earning above normal, normal or below normal return can be found out by comparing the required rate of return with the expected or average rate of return. Hence, the statements, (d) and (e) are not correct.

8. Answer : (d)

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Reason : One of the assumptions of H model is that a company experiences abnormal growth rate and normal growth rate. In the long run the abnormal growth rate reaches the normal growth rate. This happens after $2H$ years and at H years, the growth rate is exactly half way between abnormal and normal growth rate. Hence, II is true.

$$\text{Based on the assumptions, intrinsic value of the stock is given by } \frac{D_0(1+g_n)}{r-g_n} + \frac{D_0H(g_a-g_n)}{r-g_n},$$

where the first term represents the value based on the normal growth rate and the second term represents the premium due to abnormal growth rate. Hence, (III) is also true and the answer is (d).

As already said in the long run the abnormal growth rate reaches the normal growth rate i.e., if abnormal growth rate is more than the normal rate, the growth rate declines whereas if the abnormal growth rate is less than the normal rate, the growth rate increases. Hence, (I) is not true.

9. Answer : (c)

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Reason : a. is not correct as more than number of peaks and trough that touch a trend line greater its significance.
b. is not correct as it is not breadth but the length of the trend line which indicates whether a penetration is significant or not.
d. is not correct as penetration of steep trend line results in a corrective movement after which the previous trend continues.
e. is not correct as the peaks of rallies when penetrate the trend line that indicates shift in trend.

10. Answer : (e)

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Reason : According to Capital Asset Pricing Model.

$$\text{Required return} = r_F + \beta (r_m - r_F)$$

$$\text{Alpha} = \text{Expected return} - \text{Required return}$$

$$\text{If alpha} = \alpha, \text{ Then expected return} = \text{Required return} + \alpha$$

Required:

$$\text{Return} = r_F + (r_m - r_F) 1.00 = R_m$$

$$\text{Expected return} = r_m + \text{Alpha} (\alpha)$$

11. Answer : (d)

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$$\text{Reason : } \sigma_p^2 = W_A^2 \sigma_A^2 + W_B^2 \sigma_B^2 + 2 W_A W_B \rho_{AB} \sigma_A \sigma_B$$

$$133 = (0.40)^2 \times (10)^2 + (0.60)^2 \times \sigma_B^2 + 2 \times 0.40 \times 0.60 \times 0.50 \times 10 \times \sigma_B$$

$$133 = 16 + 0.36 \sigma_B^2 + 0.024 \sigma_B$$

$$= 0.36 \sigma_B^2 + 0.024 \sigma_B - 117 = 0$$

$$\sigma_B = \frac{-0.024 \pm \sqrt{(0.024)^2 - 4(0.36)(-117)}}{2(0.36)} = \frac{-0.025 \pm \sqrt{168.48}}{0.72} = \frac{-0.024 + 12.98}{0.72}$$

$$\sigma_B = 18\%$$

12. Answer : (d)

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Reason : The profitability rate increased by 0.10% which is evident from the $\frac{\text{PBT}}{\text{NS}}$ ratio. Hence (I) is correct. $\frac{\text{TA}}{\text{NW}}$ has increased from 2.25 to 2.90 which means leverage has increased. Thus, (II) is also correct. Asset turnover ratio has also increased from 1.50 to 1.72. Hence (IV) is also true. $\frac{\text{PAT}}{\text{PBT}}$ indicates tax efficiency and higher value shows lower tax burden and high tax efficiency of the firm. Hence (II) is wrong and therefore, (d) is the correct answer.

13. Answer : (e)

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Reason : Head and Shoulders and Double Top are technical indicators which indicates bearish market. Hence (a) and (d) are not correct. Double bottom indicates a bull market and triangles are commonly used to identify reversals and consolidation but are not very reliable formation. Therefore, (b) and (c) are not clear bearish signal and (e) is the answer.

14. Answer : (b)

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Reason : Relative strength of the stock = $\frac{\text{Average of upclosing prices}}{\text{Average of downclosing prices}}$

$$= \frac{235.50 + 225.10 + 230.10}{3}$$
$$= \frac{690.70}{222.10}$$
$$= \frac{230.23}{222.10} = 1.0366$$

15. Answer : (d)

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Reason : As per the efficient market hypothesis the efficiency of the stock market is tested. Under the hypothesis it is assumed that information regarding expected return is discounted in the market and the shares sell at their fair market value and equilibrium rate of return prevail. Then it talks about the forms of efficiency and possibility of earning abnormal return by the investor. In no circumstances it says that positive return cannot be earned.

16. Answer : (c)

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Reason : Undervalued stock is one on which the current market price is less than intrinsic value of the stock. Normally the intrinsic value is arrived at by capitalization of all future earnings and not by book value. Therefore, statement a) is not correct.

Further $\frac{\text{Price per share (P)}}{\text{Book Value per share (B)}} = \frac{\text{RoE} \times b}{K - g}$ where b is dividend payout ratio.

We find that $\frac{P}{B}$ is linearly related and is only dependent on payout ratio, K & g. Statement d) is not correct as higher growth rate will reduce the value of the denominator thereby pushing up the P/B value.

17. Answer : (a)

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Reason : An European call option can be exercised only on the expiration date. American option can be exercised on any future date from the time of entering the contract unto the expiration of the contract. Therefore, options (b) and (d) are not correct.

Further, if the price of underlying asset declines below the exercise price then the buyer of the call option will not exercise the option as it is not economical to exercise it. Therefore, options (c) and (e) are not correct.

18. Answer : (b)

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Reason : Forecast value of EPS

$$= \frac{S_i \times M_c \times f_c}{N_c}$$

Where, S_i = Estimated industry sales
 M_c = Estimated net profit margin of the company
 f_c = Estimated net profit margin of the company
 N_c = Number of outstanding shares of the company

On substituting the values

$$\text{EPS} = \frac{4,000 \times 0.03 \times 0.15}{3} = \text{Rs.6}$$

19. Answer : (b)

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Reason : The profit of the industry is related with entry and exit barriers as shown below

		EXIT BARRIER →	
		LOW	HIGH
ENTRY BARRIERS ↓	LOW	Low, stable returns	Low, risky returns
	HIGH	High, stable returns	High, risky returns

As higher and stable returns are desirable, it is preferable to have high entry barriers and low exist barriers. Hence (b) is the answer.

20. Answer : (e)

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Reason : All the given options are the attributes of a depository.

21. Answer : (e)

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Reason : According to Elliott Wave Theory (c) is false as the third wave is usually the longest and (d) is also false as it is wave C which confirms the end of uptrend.

22. Answer : (c)

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Reason : An option writer who writes a call option has an obligation to sell whereas the buyer or the holder has the option to buy. A call option will be exercised by the buyer only when the price of the stock on the expiration day is more than the strike price of the call option. In the given case as the price of the stock on the expiration day is less than the strike price, the option holder will not exercise the option and pays the premium of the option to the writer. Hence, the gain to the writer will be premium which in this case is Rs.3.

23. Answer : (a)

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$$\text{Beta of stock} = \frac{\text{Change in stock returns}}{\text{Change in market returns}}$$

$$\text{In the given case, Beta of stock} = \frac{4\%}{4\%} = 1$$

Alternatively it can be worked out as:

As the stock is in equilibrium,

$$r_i = r_f + \beta(r_m - r_f)$$

$$\text{i.e. } 0.16 = r_f + \beta(0.08 - r_f) \dots\dots (1)$$

with the change in economic condition, the new equation will be:

$$0.2 = r_f + \beta(0.12 - r_f) \dots\dots\dots (2)$$

Subtracting (1) from (2) we get

$$0.04 = 0.04 \beta$$

$$\beta = 1.$$

24. Answer : (e)

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Reason : Number of unique covariance terms = $\frac{n(n-1)}{2} = \frac{11 \times 10}{2} = 55$.

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

Reason : In a condition such that Required rate of return = ROE,
According to the Dividend discount model

$$P_0 = \frac{D_1}{K_e - g} \quad \text{Where the symbols are in standard use.}$$

$$\frac{P_0}{E_0} = \frac{\frac{D_0}{E_0}(1+g)}{K_e - g} \quad \text{Where, } D_0/E_0 \text{ is the Dividend payout ratio}$$

$$= \frac{(1+g)(1-b)}{K_e - g} \quad \text{Where 'b' is the retention ratio}$$

Since $K_e = \text{ROE}$ and $g = \text{ROE} \times \text{Retention ratio}$

$$\frac{P_0}{E_0} = \frac{(1+g)(1-b)}{\text{ROE} - \text{ROE} \times b}$$

$$\frac{P_0}{E_0} = \frac{(1+g)(1-b)}{\text{ROE}(1-b)}$$

We get

$$\frac{P_0}{E_0} = \frac{1+g}{\text{ROE}}$$

Hence from the above derivations we can conclude that

when the growth rate increases, the market price of the share and the price earnings ratio will increase.

The amount of earnings retained by the firm does not affect market price or the P/E. And The P/E ratio is inversely proportional to the ROE of the firm.

Since all the given statements are true the option (e) is the correct answer.

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

Reason : Futures margin depend on the price volatility of the underlying asset. Exchanges generally set this margin equal to $\mu + 3\sigma$ then μ is the average daily absolute change in the value of contract and σ is standard deviation of these changes over a period of time. Hence only (I) and (III) are correct and therefore (e) is the answer.

27. Answer : (a) [< TOP >](#)

Reason : Modified duration = $\frac{\frac{D}{YTM}}{1 + \frac{YTM}{P}}$ Where p is frequency of coupon payment.

$$= \frac{\frac{6.78}{1 + \frac{0.13}{2}}}{2} = 6.366 \text{ i.e. } 6.37 \text{ years.}$$

28. Answer : (a) [< TOP >](#)

Reason : The difference between the warrant price and the minimum value of the warrant is called as the warrant premium. If the current market price of the stock P_s is greater than the exercise price P_e , the minimum value is given by $(P_s - P_e) \times N$. When the current market price of the stock is less than the exercise price, the minimum value is zero.

In this case since the current market price of the stock is less than the exercise price, the minimum value of the warrant is zero. Therefore the warrant premium will be Rs 20. Hence the correct answer is (a).

29. Answer : (b)

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$$\begin{aligned}\text{Reason : Public offering price} &= \frac{\text{NAV}}{1 - \text{Sales charge}} \\ &= \frac{(2084.52 + 162.88 + 47.74 + 573.23 - 488.56 - 112.92) / 160}{1 - 0.025} \\ &= \frac{14.168}{0.975} = \text{Rs. } 14.53.\end{aligned}$$

30. Answer : (b)

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$$\begin{aligned}\text{Reason : Premium over conversion value} &= \frac{\text{Bond price} - \text{Conversion value}}{\text{Conversion value}} \\ \text{Where conversion value} &= \text{Current market price of the stock} \times \text{Conversion rate} \\ \text{In the given case, conversion value} &= 55 \times 20 = \text{Rs. } 1,100 \\ \text{Premium over conversion value} &= \frac{1300 - 1100}{1100} = 18.18\%.\end{aligned}$$

Section B : Problems

1. Market

RM	P _i	RM P _i	RM - E(RM)	[RM - E(RM)] ²	[RM - E(RM)] ² *P _i
14.00	0.250	3.500	6.400	40.960	10.240
13.00	0.450	5.850	5.400	29.160	13.122
-10.50	0.200	-2.100	-18.100	327.610	65.522
3.50	0.100	0.350	-4.100	16.810	1.681
Total		7.600			90.565

Expected Return on market = 7.60%

Var_M = 90.565

σ_M = 9.52%

Stock A

R _A	P _i	R _A P _i	R _A - E(R _A)	R _M - E(R _M)	R _A - E(R _A) ²	R _A - E(R _A) ² *P _i	[R _A - E(R _A)]*[R _M - E(R _M)]	[R _A - E(R _A)]*[R _M - E(R _M)]*P _i
22.500	0.250	5.625	12.075	6.400	145.806	36.451	77.280	19.320
12.000	0.450	5.400	1.575	5.400	2.481	1.116	3.827	1.722
-5.500	0.200	-1.100	-15.925	-18.100	253.606	50.721	57.649	11.530
5.000	0.100	0.500	-5.425	-4.100	29.431	2.943	2.224	0.222
Total		10.425				91.232	140.980	32.794

Expected return on stock A = ΣR_AP_i = 10.425%

Var_A = 91.232(%)²

σ_A = 9.55%

Stock B

RB	P _i	RB P _i	RB - E(RB)	R _M - E(R _M)	RB - E(RB) ²	[RB - E(RB)] ² *P _i	[RB - E(RB)]*[R _M - E(R _M)]	[RB - E(RB)]*[R _M - E(R _M)]*P _i
25.000	0.250	6.250	19.600	6.400	384.160	96.040	125.440	31.360
7.500	0.100	0.750	2.100	5.400	4.410	1.945	11.340	1.134
5.000	0.450	2.250	-0.400	-18.100	0.160	0.012	7.240	3.258
5.500	0.200	1.100	0.100	-4.100	0.010	0.000	-0.410	-0.082
Total		10.350				97.996	143.610	35.670

Expected Return on Stock B = ΣR_BP_i = 10.35%

Var_B = 97.996 (%)²

σ_B = 9.90%

$$\text{Beta}_A = \frac{\text{Cov}_{AM}}{\text{Var}_M} = \frac{[(R_A - E(R_A))][R_M - E(R_M)]P_i}{\text{Var}_M} = \frac{32.794}{90.565} = 0.362$$

$$\text{Beta}_B = \frac{\text{Cov}_{BM}}{\text{Var}_M} = \frac{35.67}{90.565} = 0.394$$

$$\text{Unsystematic Risk} = \text{Total Risk} - \text{systematic risk} = \sigma^2 - \beta^2 \sigma_M^2$$

$$\text{Stock A} = 91.232 - (0.362)^2 \times 90.565 = 79.36 (\%)^2$$

$$\text{Stock B} = 97.996 - (0.394)^2 \times 90.565 = 83.94 (\%)^2$$

$$\begin{aligned} \text{b. } R_A &= R_f + \beta_A (R_M - R_f) \\ &= 5.5 + 0.362 (7.60 - 5.5) \\ &= 6.26\% \end{aligned}$$

$$\begin{aligned} \alpha_A &= E(R_A) - \text{Required return} \\ &= 10.425 - 6.26 = 4.165 \end{aligned}$$

As alpha is positive, Stock A is under valued

$$\begin{aligned} R_B &= 5.5 + 0.394 (7.60 - 5.5) \\ &= 6.33\% \end{aligned}$$

$$\alpha_B = 10.35 - 6.33 = 4.02\%$$

As alpha is positive, Stock B is also undervalued.

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2. a We can calculate forward rates by calculating the price of zero coupon bonds

Maturity	YTM	Price	Forward rate
1	10	$\frac{1,000}{1.10} = 909.09$	—
2	11	$\frac{1,000}{(1.11)^2} = 811.62$	$\frac{(1.11)^2}{1.10} - 1 = 12.01\%$
3	12	$\frac{1,000}{(1.12)^3} = 711.78$	$\frac{(1.12)^3}{(1.11)^2} - 1 = 14.03\%$

- b. The next year's prices and yields can be calculated by discounting each zero's face value at the forward rates for the next year that we have calculated in part (a)

Maturity	Price	YTM
1 year	$\frac{1,000}{(1.1201)} = 892.78$	12.01%
2 year	$\frac{1,000}{(1.1201) \times (1.1403)} = 782.93$	13.02%

- c. Next year, the 2 year zero coupon bond will be 1-year zero coupon bond and will therefore sell at $\frac{1,000}{1.1201} = 892.78$. Similarly, the current 3-year zero coupon bond will be a 2-year zero and will sell at $\frac{1,000}{(1.1201) \times (1.1403)} = 782.93$.

Expected total return

$$\begin{aligned} \text{2-year bond} &= \frac{892.78}{811.62} - 1 = 9.99\% \cong 10\% \end{aligned}$$

$$3\text{-year bond} = -1 = 9.99\% \cong 10\%$$

- d. The current price of the bond should equal the value of each payment times, the present value of Rs.1 to be received at the time of maturity. The present value can be calculated in the following manner:

$$= 109.09 + 97.39 + 797.19 \\ = \text{Rs.} 1,003.67$$

Similarly, the expected price after 1 year can be calculated using forward rates.

$$= 107.13 + 876.88 = 984.01$$

Total expected return

$$\left(\frac{120 + 984.01 - 1,003.67}{1,003.67} \right) = 9.99\% \cong 10\%$$

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3. a. EPS = Rs 50; DPS = Rs 25; ROE = 20%; b = 0.5

Therefore $g = \text{ROE} \times b = 20\% \times 0.5 = 10\%$

$$P_0 = \frac{D_1}{k - g} = \frac{D_0(1 + g)}{k - g} = \frac{25 \times 1.10}{0.15 - 0.10} = \text{Rs } 550$$

b.

Year	EPS (Rs.)	DPS (Rs.)
0	50.00	25.00
1	55.00	27.50
2	60.50	36.30
3	64.13	38.48

From year 2 onwards, ROE declines to 15% and also the retention ratio declines to 40%. This reduces the growth rate g to 6% ($g = \text{ROE} \times b = 15 \times 0.04 = 6\%$).

Intrinsic value of Computronix

$$= \frac{D_1}{(1 + k)} + \frac{D_2}{(1 + k)^2} + \frac{D_3}{(1 + k)^3 (k - g)}$$

$$= \frac{27.5}{(1.15)} + \frac{36.30}{(1.15)^2} + \frac{38.48}{(1.15)^3 (0.15 - 0.06)}$$

$$= 23.91 + 27.45 + 323.29 = \text{Rs. } 374.65$$

- c. Since the market is unaware of the change in competitive position, it will expect the market price to grow by 10% in year 1.

$$P_1 = P_0 (1 + g) = 550 (1.10) = \text{Rs. } 605$$

After the market becomes aware of the competition at the end of second year, the price will be

$$P_2 = \frac{38.48}{(0.15 - 0.06)} = \text{Rs } 427.56$$

Since the new growth rate is 6%, the expected price in year 3 will be

$$P_3 = 427.56 \times 1.06 = \text{Rs } 453.20$$

Therefore the return on the stock will be

3	$\frac{(427.56 - 605) + 36.30}{605} = -23.33$	
	$\frac{(453.20 - 427.56) + 38.48}{427.56} = 14.99 \square 15\%$	

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4. i. Call option

The call option is 'In the money'.

$$\begin{aligned} \text{Margin} &= \text{Option premium for 1400 shares (as each contract consists of 1400 shares)} + 0.2 (\text{stock's market price}) \times 1400 \\ &= 12.7 \times 1400 + 0.2 \times 254.80 \times 1400 \\ &= \text{Rs.89,124} \end{aligned}$$

ii. Put option

The put option is 'out of the money'

a. Using First Method

$$\begin{aligned} \text{Margin} &= \text{Option premium for 1100 shares} + 0.2 \times \text{Market price per share} \times 1100 - \text{The amount by which the contract is 'out of money'} \\ &= 8 \times 1100 + 0.2 \times 323.90 \times 1100 - (323.90 - 320) \times 1100 = \text{Rs.84,348} \end{aligned}$$

b. Using Second Method

$$\begin{aligned} \text{Margin} &= \text{Option premium for 1100 shares} + 0.1 \times \text{stock market price} \times 1100 \\ &= 8 \times 1100 + 0.1 \times 323.90 \times 1100 \\ &= \text{Rs.44,429.} \end{aligned}$$

As the amount arrived through the first method is higher hence the margin amount for put option = Rs.84,348

Therefore, total margin to be deposited by the investor with brokerage firm by the investor = 89,124 + 84,348 = Rs.1,73,472

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

a. Present value of interest payments

$$\begin{aligned} &= 9 \times \text{PVIFA} (5\%, 3) + 4.50 \times \text{PVIFA} (5\%, 11) \times \text{PVIF} (5\%, 3) \\ &= 9 \times 2.7232 + 4.5 \times 8.3064 \times 0.8638 = 56.796 \\ &\cong 56.80. \end{aligned}$$

b.

Year Ended	2001	2002	2003	2004
Bonus adjusted EPS (Rs.)	2.50	3.00	3.38	3.60

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

$$2.5 (1 + g)^3 = 3.60$$

$$\begin{aligned} \Rightarrow g &= \left(\frac{3.60}{2.50} \right)^{1/3} - 1 \\ &= 0.1292 \text{ i.e. } 12.92\% \end{aligned}$$

$$\text{Projected EPS in July, 2004} = 2.40 \left(1 + \frac{0.1292}{3} \right) = \text{Rs.2.50}$$

Average P/E ratio between January 2004 to July 2004 (6 months period prior to conversion)

$$= \frac{12 + 11.8 + 11.5}{3} = 11.77.$$

Therefore, projected market price of share after 18 months = 2.50 × 11.77 = Rs.29.43

Present value of market value of conversion after eighteen months

$$= 29.43 \times 2 \times \text{PVIF} (5\%, 3)$$

$$= 58.86 \times 0.8638 = \text{Rs.}50.84$$

Present value of non-convertible portion redeemed after 7 years

$$= 100 \times \text{PVIF} (5\%, 14)$$

$$= 50.51$$

- d. Intrinsic value of the PCD = A + B + C
- $$= 56.80 + 50.84 + 50.51$$
- $$= \text{Rs.}158.15$$

Therefore, it is recommended not to invest in the proposed PCD as it's intrinsic value is less than the issue price and the projected declining P/E ratio may take the price of convertible portion further down.

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6.

Date	Advances	6-Day Total of Advances	Declines	6-Day Total of Declines	6-Day Momentum Oscillator
(1)	(2)	(3)	(4)	(5)	(6) = (3)/(5)x100
2-Aug-04	338		408		
3-Aug-04	312		431		
4-Aug-04	342		395		
5-Aug-04	601		160		
6-Aug-04	280		464		
9-Aug-04	427	2300	315	2173	105.84
10-Aug-04	444	2406	302	2067	116.40
11-Aug-04	130	2224	632	2268	98.06
12-Aug-04	191	2073	559	2432	85.24
13-Aug-04	392	1864	339	2611	71.39

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Section C: Applied Theory

7. The investment objectives and constraints faced by investors

Investment Objectives

Rationally stating, all personal investing is designed in order to achieve a goal, which may be tangible (e.g., a car, a house, etc.) or intangible (eg., social status, security, etc.). Goals can be classified into various types based on the way investors approach them viz:

a. Near-Term High Priority Goals

These are goals which have a high emotional priority to the investor and he wishes to achieve these goals within a few years at the most. Eg: A new house. As a result, investment vehicles for these goals tend to be either in the forms equivalent to cash or as fixed-income instruments with maturity dates in correspondence with the goal dates. Because of the high emotional importance these goals have, investor, especially the one with moderate means will not go for any other form of investment which involves more risk especially where his goal is just in sight.

b. Long-Term High Priority Goals

For most people, this goal is an indication of their need for financial independence at a point some years ahead in the future. Eg: Financial independence at the time of retirement or starting a fund for the higher education of a three-year old child. Normally, we find that either because of personal preference or because the discounted present value is large in relation to their resources, the time of realization for such goals is set around 60 years of age for people of moderate means. Because of the long-term nature of such goals, there is not a tendency to adopt more aggressive investment approaches except perhaps in the last 5 to 10 years before retirement. Even then, investors usually prefer a diversified approach using different classes of assets.

c. Low Priority Goals

These goals are must lower down in the scale of priority and are not particularly painful if not achieved. For people with moderate to substantial wealth, these could range from a world tour to donating funds for charity. As a result, investors often invest in speculative kinds of investments either for the fun of it or just to try out

some particular aspect of the investment process.

d. Entrepreneurial or Money Making Goals

These goals pertain to individuals who want to maximize wealth and who are not satisfied by the conventional saving and investing approach. These investors usually put all the spare money they have into stocks preferably of the company in which they are working/owning and leave it there until it reaches some level which either the individual believes is enough or is scared of losing what has been built-up over the years. Even then, the process of diversification and building up a conventional portfolio usually takes him a long time involving a series of opportunities and sales spread over many years.

Investment Constraints

An investor-seeking fulfillment of one of the above goals operates under certain constraints:

- Liquidity
- Age
- Need for Regular Income
- Time Horizon
- Risk Tolerance
- Tax Liability

The challenge in investment management, therefore, lies in choosing the appropriate investments and designing a unit that will meet the investment objectives of the investor subject to his constraints. To take on this challenge the first step will be to get acquainted with the different types of investments that are available in our financial market.

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8. Basic Tenets

The most important element of wave theory is wave patterns of formations. The other important aspect is ratio analysis which is useful in determining retracement points and price objectives by measuring the relationships between the different waves. Finally, time relationships also exist and can be used to confirm the wave patterns and ratios, but are considered by some Elliotticians to be less reliable in market forecasting.

- Elliott Wave Theory, was originally applied to the major stock market averages, particularly the Dow Jones Industrial Average. In its most basic form, the theory says that the stock market follows a repetitive rhythm of a five-wave advance followed by a three-wave decline. Shows one complete cycle. If you count the waves, you will find that one complete cycle has eight waves – five up and three down. In the advancing portion of the cycle, notice that each of the five waves are numbered. Waves 1,3 and 5 – called impulse waves are rising waves, while waves 2 and 4 move against the uptrend. Waves 2 and 4 are called corrective waves because they correct waves 1 and 3. After the five-wave numbered advance has been completed, three-wave correction begins. The three corrective waves are identified by the letters A,B and C.
- Along with the constant form of the various waves, there is the important consideration of degree. There are many different degrees of trend. Elliott, in fact, categorized nine different degrees of trend (or magnitude) ranging from a Grand Supercycle spanning two hundred years to a subminute degree covering only a few hours. The point to remember is that the basic eight-wave cycle remains constant no matter what degree of trend is being studied.
- Each wave subdivides into waves of one lesser degree which in, turn, can also be subdivided into waves of even lesser degree. It also follows then that each wave is itself part of the wave of the next higher degree.

Wave Personalities

Another area where the two theories overlap to some extent is in the description of the three phases of a bull market. A knowledge of these wave personalities can be helpful, especially when wave counts are unclear. It's also important to remember that these wave personalities remain constant in all the different degrees of trend.

Wave 1

About half of the first waves are part of the basing process and often appear to be nothing more than a rebound from very depressed levels. First waves are usually the shortest of the five waves. These first waves can sometimes be dynamic, especially if they occur from major base formations.

Wave 2

Second waves usually retrace or give back, all or most of wave 1. The ability of wave 2, however, to hold above the bottom of wave 1 is what produces many of the traditional chart patterns, such as double or triple bottoms and inverse head and shoulders bottoms.

Wave 3

The third wave is usually the longest and the most dynamic, at least in the common stock area. The penetration of the top of wave 1 registers all kinds of traditional breakouts and Dow Theory buy signals. Virtually, all technical trend following systems have jumped on the bull bandwagon by this point. Volume is usually the heaviest during this wave and gaps prevail. Not surprisingly, the third wave is also the most likely to extend. Wave 3 can never be the shortest in a five-wave advance. By this time, even the fundamentals are looking good.

Wave 4

The fourth wave is usually a complex pattern. Like wave 2, it is corrective or a consolidation phase, but usually differs from wave 2 in its construction. Triangles usually occur in the fourth wave. One cardinal rule of Elliot analysis is that the bottom of wave 4 can never overlap the top of wave 1.

Wave 5

In stocks, wave 5 is usually much less dynamic than wave 3. In commodities, wave 5 is often the longest wave and one most likely to extend. It is during wave 5 that many of the confirming technical indicators, such as On Balance Volume (OBV), begin to lag behind the price action. It is also at this point that negative divergences begin to develop on various oscillators, warning of a possible market top.

Wave A

Wave A of the corrective phase is usually misinterpreted as just a normal pull-back in the uptrend. Having already spotted several oscillator divergences on the prior advance, the alert technician may also notice a shift in the volume pattern at this point. Heavier volume may now have shifted to the downside, although that is not necessarily a requirement.

Wave B

Wave B, the bounce in the new downtrend, usually occurs on light volume and usually represents the last chance to exit old long positions gracefully and a second chance to initiate new short sales. Depending on the type of correction taking place, the rally may test the old highs (forming a double top) or even exceed the old highs before turning back down.

Wave C

Wave C leaves little doubt that the uptrend has ended. Again, depending on the type of correction in progress, wave C will often decline well below the bottom of wave A, registering all kinds of traditional technical sell signals. Infact, by drawing a trendline under the bottoms of wave 4 and wave A, the familiar head the shoulders top sometimes appears.

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