Question Paper
Introduction to Security Analysis (MB3G1F) : January 2009
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/are **false** with respect to the Price to Book Value (P/BV) ratio? <Answer>

I. P/BV ratio can be calculated even for firms with negative earnings.
II. If a firm has continuous negative earnings, the book value of equity can become negative leading to a negative P/BV ratio.
III. When the required rate of return increases, the P/BV ratio goes up.

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

2. If a vertical rally or a decline is interrupted by a consolidation pattern akin to a rectangle, such a formation is called <Answer>

(a) Saucers and Rounding Tops
(b) Double Tops and Bottoms
(c) Head and Shoulders
(d) Gaps
(e) Flags.

3. The market rate of interest on 2-year bond is 8.63% while the rate on one year bond is 8.21%. The forward rate on a one year bond, one year from now is 8.45%. Assuming pure expectations theory holds good, the liquidity premium to induce investors to hold the 2 year bond is <Answer>

(a) 0.30%
(b) 0.46%
(c) 0.52%
(d) 0.61%
(e) 0.74%.

4. Which of the following statements is **false** with respect to the forward contracts? <Answer>

(a) Terms are structured to suit both the contracting parties
(b) Traders have no compulsion to deposit initial margin irrespective of their trading positions
(c) No organization guarantees the performance of the counterparty
(d) Traders have to pay daily settlement margin depending on the movement in the price of the underlying stock
(e) It is an over-the-counter product.

5. Which of the following reduces assets and stockholder's equity? <Answer>

(a) Stock splits
(b) Cash dividends
(c) Stock dividends
(d) Reverse stock splits
(e) Bonus issues.

6. Which of the following principles is **true** while analyzing trend line 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 reach the trend line and then return with penetration, the recurrence of this tendency indicates that the trend "obeys" the trendline.

7. Swagat Housing Ltd. has a project of constructing a Multiplex in Hyderabad. The project is financed by 35% equity and the remaining from issuance of bonds bearing a coupon rate of 7.5% p.a. maturing in 7 years. The required rate of return for equity holders is 20%. If a sinking fund is established to redeem the bonds, the capitalization rate is <Answer>

(a) 12.51%
(b) 13.49%
(c) 14.26%
(d) 15.78%
(e) 19.27%.

8. Which of the following statements is/are **true** with respect to the "market extraction method" to derive the capitalization rate of real assets? <Answer>

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

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

9. Mr. Suman Sen, an employee of Taurus Ltd., was not able to earn profit from the information he had about the likely profit figure for the company, even after trying for an extended period of time. This means that the market is exhibiting <Answer>

(a) Weak form of market efficiency
(b) Semistrong form of market efficiency
(c) Super strong form of market efficiency
(d) Near strong form of market efficiency
(e) Inefficiency.

10. Which of the following statements is **false** with respect to Head and Shoulders price pattern? <Answer>

(a) Volume is low at the left shoulder and continues to rise, albeit at a lower rate at the head
(b) The left shoulder signifies the penultimate rally in the bull market
(c) Neckline is a line that joins the points from where the final rally begins and ends
(d) The right shoulder confirms the beginning of a bear market
(e) Head and shoulders pattern occurring at market bottoms is called inverted head and shoulder.

11. Consider the following information: <Answer>

Stock	Return (%)	Variance $(\%)^2$	Weight in the portfolio
Arvind Ltd.	12	361	0.55
Dabur Ltd.	10	225	0.45

If the variance of the returns of portfolio is 180 $(\%)^2$, the coefficient of correlation between the stocks return is

(a) –0.2527
(b) –0.1642
(c) +0.1788
(d) +0.2145
(e) +0.2314.

12. Which of the following is a natural entry barrier? <Answer>

(a) Control over raw material
(b) Licensing policy of government
(c) Control over technology
(d) Economies of scale
(e) Control over market through strong brand equity.

13. Which of the following statements is/are **true** of growth industries? <Answer>

I. They are considered to be most likely to benefit from a period of economic prosperity and most likely to suffer from a period of economic slowdown.
II. They are least hurt in periods of economic slowdown.
III. During economic slowdown their earnings might very well expand while the earnings of other industries decline.
IV. They are generally characterized by expectation of abnormal returns, often independent of business cycle.

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

14. The cash earning per share of Mithun Industries Ltd. is Rs.15 and the sales of the company is Rs.540 lakhs. The depreciation provided by the company is Rs.50 lakhs. If the company has 10 lakhs shares outstanding, the net profit margin of the company is <Answer>

(a) 18.52%
(b) 27.12%
(c) 32.41%
(d) 41.77%
(e) 50.07%.

15. The following are the areas where significant diversities are observed with respect to the accounting policies, **except** <Answer>

(a) Valuation of fixed assets
(b) Valuation of inventories
(c) Treatment of gratuity liability
(d) Treatment of capital
(e) Treatment of Research and Development expenditure.

16. Which of the following is/are the applications of ex-ante SML? <Answer>

I. Test of asset pricing theories.
II. Test of market efficiency.
III. Evaluating the performance of a portfolio manager.
IV. Identifying undervalued securities.

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

17. Which of the following statements is **not true**? <Answer>

(a) Economic Value Added (EVA) is primarily used for evaluating the performance of management
(b) EVA serves as a proxy for measuring a stock's performance
(c) EVA cannot be applied to calculate NPV
(d) Market Value Added (MVA) serves as a measure of a firm's external performance
(e) MVA can be computed by discounting the EVA of each year by the WACC.

18. Amazon Inc. recently issued 15-year bonds. The bonds have a coupon rate of 7.5 percent and pays interest semi-annually. The bonds are callable in 5 years at a call price equal to 13 percent premium to par value. The par value of the bonds is Rs. 1,000. If the yield to maturity is 6 percent, yield to call is <Answer>

(a) 3.45%
(b) 4.21%
(c) 5.07%
(d) 6.28%
(e) 7.34%.

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

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

20. Which of the following is a purpose for the construction of stock indices? <Answer>

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

21. The required rate of return of a company is 18%. It has paid a dividend of Rs.3.50 for the last year. If the stock is currently trading at its intrinsic value of Rs.65.50, the growth rate in dividend is <Answer>

(a) 11.32%
(b) 12.01%
(c) 13.61%
(d) 14.55%
(e) 15.79%.

22. Which of the following statements is **not true** with respect to the mutual funds? <Answer>

(a) Net Asset Value (NAV) represents the fair value of a unit of a mutual fund scheme
(b) The units of closed-ended funds are generally not redeemable at their NAV
(c) The NAV and the price at which the units of mutual funds are traded in secondary market are not the same
(d) Open-ended mutual fund companies buy and sell units at their NAV
(e) Closed-ended funds channelize funds in secondary market in acquisition of corporate securities.

23. An option writer writes a 6-month naked call option on a stock at a premium of Rs.13 and the strike price of Rs.225. The prevailing market price of the stock is Rs.210. If on the expiration day the price of the stock is Rs.220, then the profit/loss to the option writer will be <Answer>

(a) − Rs.10
(b) Rs. 3
(c) Rs. 7
(d) Rs.10
(e) Rs.13.

24. Following data pertaining to Vaibhav Ltd. are given below: <Answer>

Day	Closing price (Rs.)	100 EMA for previous day (Rs.)
1	75.00	71.00
2	78.00	72.50
3	84.00	73.00

The 100 day EMA for day 3 is

(a) Rs. 52.58
(b) Rs. 67.89
(c) Rs. 73.22
(d) Rs. 81.05
(e) Rs. 96.41.

25. Which of the following is **true** with respect to realized yield? <Answer>

(a) The realized yield cannot be used to estimate rates of return attainable from various trading strategies
(b) A low realized yield reflects an investor's expectation of substantial capital gains in a fairly short period of time
(c) The realized yield depends only on the holding period chosen
(d) The realized yield will always lie between the YTM and the reinvestment rate
(e) For bonds with shorter term to maturity, realized yield will be closer to reinvestment rate.

26. Given below is the data of two similar residential properties: <Answer>

Property	Sales price (Rs.)	Gross annual income (Rs.)
A	25,00,000	1,20,000
B	22,50,000	1,05,000

If the gross annual income of property 'C', which is similar in characteristics to the above two properties is Rs.1,15,000, the indicated market value of property 'C' as per gross income multiplier method is

(a) Rs.23,35,500
(b) Rs.24,00,000
(c) Rs.24,29,950
(d) Rs.25,19,350
(e) Rs.26,00,000.

27. Which of the following statements is/are **not true** regarding the lead indicator approach? <Answer>

I. It forecasts GNP in the short run.
II. It puts forward magnitude and duration of change in the economic activity.
III. The indicator should fit logically with the business cycle theory.
IV. It measures how widespread a phenomenon is.

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

28. The duration for a bond paying semi-annual coupon is 6.72 years for a maturity of 10 years. If the YTM of the bond is 12.5% with a coupon rate of 11% and the face value is Rs.100, the modified duration of the bond is <Answer>

(a) 4.78 years
(b) 5.21 years
(c) 6.32 years
(d) 7.14 years
(e) 8.22 years.

29. Which of the following statements is/are **true** of the constant growth Dividend Discount Model? <Answer>

I. It assumes that each future dividend is (1 + g) times greater than the prior dividend.
II. It assumes that the discount rate is greater than the growth rate.
III. It assumes that the increase in growth rate is constant over time.

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

30. Consider the following data of Omega Mutual Fund (Income plan): <Answer>

	(Rs. million)
Value of investments	3474.20
Receivables	260.60
Accrued income	173.60
Other current assets	521.00
Liabilities	390.86
Accrued expenses	86.80

Number of outstanding units is 200 million. Exit load applicable to this scheme is 2.5%. If the investor sells his units, the per unit price he will get is

(a) Rs.20.2526
(b) Rs.20.1539
(c) Rs.19.7587
(d) Rs.19.3635
(e) Rs.19.2647.

END OF SECTION A

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Section B : Problems/Caselet (50 Marks)

vertible bonds issued recently by Suhana Seeds Ltd.:

= Rs. 1,000
= 12.5%
= 5 years
= Rs. 1,106
= Rs. 189

d) = 5
= Rs. 5

e above convertible bond, you are **required** to calculate:

fferential.

k even period.

c. Payback period.

Consider the following prices of the stock of Bharti Airtel and the corresponding value of the Market Index:

End of Month	Bharti Airtel (Rs.)	Closing Value of Market Index
February 2008	846.15	5223.50
March 2008	828.05	4734.50
April 2008	901.20	5165.90
May 2008	858.45	4870.10
June 2008	747.95	4040.55
July 2008	809.90	4332.95
August 2008	804.50	4360.00
September 2008	750.25	3921.20
October 2008	616.45	2885.60
November 2008	659.45	2848.45

You are **required** to calculate:

a. The characteristic line for stock of Bharti Airtel.

b. The proportions of systematic risk and unsystematic risk in the total risk of the stock of Bharti Airtel.

A bond issued by Spring Textiles Ltd. is selling presently at a face value of Rs.100 and pays coupon at the rate of 13% p.a. in arrears, which will be redeemed at Rs.113 after five years. The 'n' years spot rate of interest y_n, is given by $y_n(\%) = 8.5 + \frac{n}{6}$ where, n = 1, 2 3, 4 and 5. The term structure of interest rates is flat and pure expectation theory holds good.

You are **required** to calculate:

a. The value of the bond at time 0.

b. The duration of the above bond.

c. Change in bond price for 50 basis point increase in interest rates.

Aqua Ltd., is a company operating in a mature industry. Presently, its EPS is Rs.6.75. Aqua's dividend payout ratio is 60% and ROE is 10% and both of these are expected to be the same in the near future. The beta of the company is 0.86. The treasury bill rate is 9.86% and the average return from the market is 15.26%.

You are **required** to calculate:

a. The intrinsic value of Aqua Ltd. shares using Dividend Discount Model (DDM).

b. The intrinsic value of Aqua Ltd. shares using DDM while considering that the company acquires another company and as a result dividends grow at 20% for the next three years and return to the constant historical growth rate from 4th year.

Caselet

Read the caselet carefully and answer the following questions:

The caselet says that through careful planning an investor can manage the risk. Discuss the various strategies an investor can adopt to limit his risk exposure with the potential of returns.

Most investors are aware that one must take greater risks to achieve higher returns. However, no one wants to take more risk than necessary to achieve one's financial goals. Diversification can help reduce risk. But diversification also has the limitations attached with it. Explain the limitation of diversification with suitable explanation.

Risk – Just the thought of it can give investors sleepless nights. However, through careful planning for your financial future, you can help manage risk.

Risk is something you encounter everyday. Even crossing a busy street involves some risk. With investments, balancing risk and return can be a tricky operation. All investors want to maximize their return, while minimizing risk. Let's face it, putting your hard earned money on the line can be downright frightening.

Some investments are certainly more "risky" than others, but no investment is risk free. Trying to avoid risk by not investing at all can be the riskiest move of all. That would be like standing at the curb, never setting foot into the street. You'll never be able to get to your destination if you don't accept some risk. In investing, just like crossing that street, you carefully consider the situation, accept a comfortable level of risk, and proceed to where you're going. Risk can never be eliminated, but it can be managed.

Most investors find it difficult to diversify effectively across the full spectrum of cash and individual stocks and bonds. That is why so many investors have chosen variable products to apply the strategies previously mentioned. Mutual funds, variable annuities, variable universal life insurance products offer the potential for maximizing investment performance, investment flexibility, and convenience. They allow you to allocate investments among several asset categories to tailor the mix to suit your needs. In addition they offer professional investment management, and allow you to leave the day-to-day decisions to the "experts." Of course, like any investment, these products involve risk and you should read prospectus carefully to see if they are right for you before investing.

An old proverb states, "The best time to plant a tree was yesterday. The second best time to plant a tree is today." This "power of time" concept applies to personal finance as well. The sooner you implement your investment plan, the greater the wealth you can potentially accumulate. In addition, the longer your time horizon, the easier it is to ride out the ups and downs of your investments. The length of time investors hold onto their portfolios is one of the crucial factors determining the likelihood of obtaining a positive return. Financial history indicates that investors are amply rewarded in the long-term for assuming risk. Regrettably there's no magic potion for eliminating risk. But by carefully creating a long-term,

diversified investment program you can help manage risk.

END OF CASELET

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. Fundamental analysis holds various techniques for forecasting economic scenario. Explain the important techniques of forecasting economic scenarios. **(10 marks)** <Answer>

8. Valuation of real estate is a very important phenomenon which includes various characteristics that are different from that of the valuation of bonds. Explain. **(10 marks)** <Answer>

END OF SECTION C

END OF QUESTION PAPER

Suggested Answers
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Section A : Basic Concepts

ANSWER **REASON**

1. B P/BV ratio is affected by the required rate of return. When the required rate of return increases, P/BV ratio goes down. Hence, option (b) is the answer. < TOP >

2. E If a vertically rally or a decline is interrupted by a consolidation pattern akin to a rectangle, such a formation is called flags. < TOP >

3. A Assuming pure expectations theory hold good, two years interest rate, $r_{0,2}$ will be calculated from following expressions. < TOP >

$(1 + r_{0,2})^2 = (1 + r_{0,1})\ (1+f_{1,2}) = (1+0.0821)\ (1+0.0845) = 1.17$

$\Rightarrow r_{0,2} = \sqrt{1.17} - 1 = 8.33\%.$

Hence liquidity premium

$= 8.63 - 8.33 = 0.30\%.$

4. D In futures contract, trades have to pay daily settlement margin depending on the movement in the price of the underlying stock. Hence option (d) is false. < TOP >

5. B Stock splits, stock dividends, bonus issues, as well as reverse stock split do not change the level of shareholder's equity (i.e., paid up capital and reserves). Only cash dividends of earnings is paid out and reserves of the shareholder's equity. It leads to reduction in owner's equity at any given point of time. < TOP >

6. C A steep trend line is easily violated by small sideward movements in the price chart, and is not particularly useful in identifying reversals. Hence option (c) is true. Other statements are false. < TOP >

7. E < TOP >

Contribution required to sinking fund $= \frac{i}{(1+i)^n - 1} = \frac{0.075}{(1+0.075)^7 - 1} = 11.38\%$

Interest rate of bonds = 7.5%, hence total payment on bonds = 7.5% + 11.38% = 18.88%.

Calculation of capitalization rate

Instruments	Employed (%)	Required rate (%)	Weighted rates (%)
Equity	35	20.00	7.00
Bonds	65	18.88	12.27
			19.27

Therefore the capitalization rate is = 19.27%

8. D Statement II relates to Bond of Investment method. Statement III relates to Built-up method. < TOP >

9. C Alternative (a) and (b) are not correct as only historical and publicly held information are discounted by them respectively. < TOP >

Alternative (d) is not correct as in the near strong form the analysis made by analysts and the experts e.g. mutual funds in the field is discounted by the market.

The market is not showing inefficiency and alternative (e) is not true.

In only super strong form of market efficiency the insider information is discounted by the market.

10. A Volume is very high at the left shoulder and continues to rise, albeit at a lower rate at the head. Hence option (a) is false. < TOP >

11. C $\sigma_P^2 = W_A^2 \sigma_A^2 + W_D^2 \sigma_D^2 + 2W_A W_D \rho_{AD} \sigma_A \sigma_D$ < TOP >

$180 = (0.55)^2 \times 361 + (0.45)^2 \times 225 + 2 \times 0.55 \times 0.45 \times \rho_{AD} \times 19 \times 15$

$180 = 154.77 + 141.08\ \rho_{AD}$

$\rho_{AD} = (180\text{-}154.77)/141.08 = 0.1788$

12. D Labour intensive, capital intensive, learning curve and economies of scale are natural entry barriers, and control over raw material, licencing policy of government, control over technology and control over market through strong brand equity are artificial entry barriers. < TOP >

Hence (d) is the answer.

13. D The growth industries provide above normal returns independent of business cycle. So, except the Statement (IV), All the remaining statements are not true. Hence option (d) is the answer. < TOP >

14. A < TOP >

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

$15 = \frac{PAT + 50\ lakh}{10\ lakh}$

Therefore, PAT = 100 lakhs.

Net Profit margin = PAT/Sales = 100/540 = 18.52%

Therefore, Option (a) is the correct answer.

15. D The areas where divergent accounting policies are < TOP >

Valuation of fixed assets

Valuation of inventories

Treatment of gratuity liability

Treatment of Research and Development expenditure

But, all the companies follow the homogeneous policy regarding the Treatment of capital.

Hence, option (d) is the answer.

16. A The applications of ex-ante SMLs are: < TOP >

I. Identifying undervalued securities.

II Determining the consensus, 'price of risk' implicit in current market prices.

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

17. C MVA serves as a measure of a firm's external performance and it can be computed by discounting the EVA of each year by the WACC. Some advantages of EVA are that it is primarily used for evaluating the performance of management. It serves as a proxy for measuring a stock's performance and it can be applied to capital budgeting problems like NPV. Therefore statement (c) is not true and is the answer. < TOP >

18. D The price of the bond is < TOP >

$= 37.5 \times PVIFA_{3\%, 30} + 1000 \times PVIF_{3\%, 30}$

$= 1147.02$

Yield to call

$1147.02 = 37.5 \times PVIFA_{i\%, 10} + 1130 \times PVIF_{i\%, 10}$

i = 3.14%

Annually = 3.14 × 2 = 6.28%.

19. B $12 = R_f + 2\,(10 - R_f)$ < TOP >

i.e., $R_f = 20 - 12 = 8\%$

Revised $R = 8 + 2\,(12 - 8) = 16\%$.

20. D Market indices are designed to serve as indicators of broad movements in the securities market and as a sensitive barometer to the changes in trading pattern in the market. < TOP >

21. B < TOP >

$$P_0 = \frac{D_0(1+g)}{k-g} = 65.50$$

$$= \frac{3.5(1+g)}{0.18-g} = 65.50$$

$3.5 + 3.5g = 11.79 - 65.50g$

$69g = 8.29$

$g = 12.01\%$.

22. D As the intrinsic value of the security represents the fair value of the security, the Net Asset Value (NAV) represents the fair value of a unit in a mutual fund. Statement (a) is true. < TOP >

Open-ended mutual fund companies sell new shares at NAV plus a loading or management fee and redeem them at their NAV. Statement (d) is not true.

The shares of closed-ended funds are not redeemable at their NAV as the open-ended funds. On the other hand, these shares are traded in secondary market on stock exchanges at market prices that may be above or below their NAV. Therefore the NAV and the price at which the units of mutual funds are traded in secondary market need not be always equal. Statement (b) & (c) are true.

Close-ended funds channelize funds in secondary market in acquisition of corporate securities. Statement (e) is true.

Hence (d) is the answer.

23. E 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. Hence, the gain to the writer will be premium which in this case is Rs.13. < TOP >

Hence (e) is the answer.

24. C The exponent for the 100-day EMA is $2/100 = 0.02$ < TOP >

Difference in EMA= $(84 - 73) \times (0.02) = 0.22$

100 day EMA for day 3= $73.00 + 0.22$ = Rs. 73.22

25. D The realized yield canbe used to estimate rates of return attainable from various trading strategies < TOP >

A high realized yield reflects an investor's expectation of substantial capital gains in a fairly short period of time

The realized yield depends on the holding period chosen and the reinvestment rate

The realized yield will always lie between the YTM and the reinvestment rate

For bonds with longer term to maturity, realized yield will be closer to reinvestment rate, and for the bonds with shorter term to maturity, realized yield will be closer to the YTM.

Hence statement (d) is true and is the answer.

26. C First we calculate the gross annual income multiplier for these two units. < TOP >

Gross Income Multipler (GIM) = $\frac{\text{Sales price}}{\text{Gross Annual Income}}$

Property A: GIM = 20.83

Property B: GIM = 21.43

Average GIM = 21.13.

Indicated market value of the third unit is Average GIM x Gross Annual income of the third property = 21.13 x 1,15,000 = Rs. 24,29,950. Hence (c) is the answer.

27. D The lead indicator approach attempts to forecast the general economic conditions by identifying economic indicators that turn ahead of the change in the general level of economic activity. It identifies factors that provide advance signals of the turning points in the economy. It only provides direction of the change but not magnitude and duration of change. The indicator should also fit logically with the business cycle theory. Statement (II) is not true and statement (III) is true. < TOP >

Statement (I) is not true because it pertains to GNP model building approach.

Statement (IV) is not true because it pertains to Diffusion index approach.

Hence (d) is the answer.

28. C < TOP >

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

$= \frac{6.72}{1+\frac{0.125}{2}} = 6.32$ years

29. D As per DDM < TOP >

$P_0 = \frac{D_0(1+g)}{k-g}$

The underlying assumptions are:

i. It assumes that each future dividend is (1+g) times greater than prior dividend
ii. The discount rate, k > growth rate, g
iii. The growth rate, g remains constant.

30. E NAV = (Value of investments + Receivables + Accrued income + Other current assets – Liabilities – Accrued Expenses) / Number of units outstanding < TOP >

= (3474.2 + 260.6 + 173.6 + 521 – 390.86 – 86.8)/200 = Rs.19.7587

Now the selling price of the investor will be 19.7587 * (1–0.025) = Rs.19.2647

Hence (e) is the answer.

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Section B : Problems/Caselet

1.a. Cash flow differential

= Face value × Coupon rate – Conversion value × Dividend yield

= $1000 \times 0.125 - (189 \times 5) \times \frac{5}{189}$

= 125 – 25 = Rs. 100

b. Break-even period = $\frac{\text{Conversion premium}}{\text{Interest Income} - \text{Dividends}} = \frac{1106 - 189 \times 5}{125 - 25}$

= $\frac{161}{100}$ = 1.61 year

c. Payback period = $\frac{\%\,\text{Premium}/(1 + \%\,\text{premium})}{\left[\text{Current yield} - \frac{\text{Dividend yield}}{1 + \%\,\text{premium}}\right]}$

Premium over conversion value = Current market price of the bond

– Current share price × Number of shares

= 1106 – 189 × 5 = 161

% Premium = $\frac{161}{945} \times 100$ = 17.04%

On substituting the values,

Payback period = $\frac{0.1704/(1 + 0.1704)}{\left[\frac{125}{1106} - \frac{5/189}{1 + 0.1704}\right]} = \frac{0.14559}{(0.1130 - 0.0226)}$ = 1.61 years.

2. a. The returns on Bharti Airtel and market index are as follows:

Month	Return on the stock of Bharti Airtel (y) %	$(y - \bar{y})$	$(y - \bar{y})^2$	Return on Market index (x)%	$(x - \bar{x})$	$(x - \bar{x})^2$	xy	x^2
February 2008								
March 2008	-2.13	0.19	0.036	-9.36	-3.49	12.18	19.93	87.61
April 2008	8083	11.15	124.32	9.11	14.98	224.40	80.44	82.99
May 2008	-4.74	-20.42	5.85	-5.72	0.15	0.0225	27.11	32.71
June 2008	-12.87	-10.55	111.30	-17.03	-11.16	124.54	219.17	290.02
July 2008	8.28	10.60	112.36	7.23	13.1	171.61	59.86	52.27
August 2008	-0.66	1.66	2.75	0.62	6.49	42.12	0.41	0.38
September 2008	-6.74	-4.42	19.53	-10.06	-4.19	17.55	67.80	101.20
October 2008	-17.83	-15.51	240.56	-26.41	-20.54	421.89	470.89	697.48
November 2008	6.97	9.29	86.30	-1.28	4.59	21.06	-8.92	1.63

	$\bar{y}$ = -20.89/9 = -2.32		$\Sigma(y-\bar{y})^2$ = 703	$\bar{x}$ = -52.9/9 = -5.87		$\Sigma(x-\bar{x})^2$ = 1035.37	Σxy =936.69	Σx^2 = 1346.29

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

$$\beta = \frac{n\Sigma xy - \Sigma x\,\Sigma y}{n\Sigma x^2 - (\Sigma x)^2} = \frac{9\times 936.69 - (-52.9)(-20.89)}{9\times 1346.29 - (-52.9)^2} = 0.786$$

$$\alpha = \frac{1}{n}(\Sigma y - \beta\,\Sigma x) = [(-20.89) - 0.786\times(-52.9)]\frac{1}{9} = 2.298$$

Mean return on market = -5.87

Characteristic line: R_i = $2.298 + 0.786R_m$

Where R_i is the return on Bharti Airtel and R_m is the return on the market.

b. Variance of returns from Bharti Airtel $\sigma_S^2 = \frac{\Sigma(y-\bar{y})^2}{n-1} = \frac{703}{8} = 87.87(\%)^2$

Standard deviation of returns on Bharti Airtel $\sigma_S = \sqrt{\sigma_S^2} = \sqrt{87.87} = 9.37$

Variance of market return $\sigma_m^2 = \frac{\Sigma(x-\bar{x})^2}{n-1} = \frac{1035.37}{8} = 129.42(\%)^2$

Standard deviation of market return $\sigma_m = \sqrt{129.42} = 11.37$

Systematic risk = $\beta^2\sigma_m^2 = 0.786^2 \times 129.42 = 79.95(\%)^2$

Proportion of systematic risk = $\frac{79.95}{87.87} = 0.9099\% = 90.99\%$

Unsystematic risk = 1 – 0.9099 = 0.0901=9.01%.

3.a. The value of the bond at time = 0

$y_1 = 8.5 + 1/6 = 0.0867$

$y_2 = 8.5 + 2/6 = 0.0883$

$y_3 = 8.5 + 3/6 = 0.09$

$y_4 = 8.5 + 4/6 = 0.0917$

$y_5 = 8.5 + 5/6 = 0.0933$

$13\,(PVIF_{8.67\%,1} + PVIF_{8.83\%,2} + PVIF_{9.0\%,3} + PVIF_{9.17\%,4} + PVIF_{9.33\%,5}) + 113 \times PVIF_{9.33\%,5}$

$= 13\,(0.920 + 0.844 + 0.72 + 0.704 + 0.640) + 113 \times 0.640$

$= 122.76$

b. $100 = 13\,PVIFA_{(r\,5)} + 113\,PVIF_{(r\,5)}$

If r = 15%,

R.H.S = 13(3.3522) + 113 (0.4972) = 99.7622

⇨ r_d = 15%

Duration

$$= \frac{r_c}{r_d} \times PVIFA_{(r_d,n)} \times (1+r_d) + \left(1 - \frac{r_c}{r_d}\right) \times n$$

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

= 3.34 + 0.67

= 4.01 years

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c. $D_{mod} = \frac{D}{1+\frac{r_d}{f}} = \frac{4.01}{1.15} = 3.49$ years

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

= - 3.49 years × 50/100 = -1.745%

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

Therefore new price = 100 (1 - 0.01745) = Rs. 98.26

4. Required rate of return for Aqua Ltd. = $R_f + \beta_i (R_m - R_f)$

= 9.86 + 0.86 (15.26 – 9.86)

= 9.86 + 4.64 = 14.5%

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a. $V_o = \frac{D_o(1+g)}{K_e - g}$

$g = RoE (1 - d) = 0.1 (1 - 0.60)$

(where **d** is the dividend payout ratio)

= 0.1 (0.4)

= 0.04 ⇒ 4%

$D_o = 6.75 \times 0.6 = 4.05$

$V_o = \frac{4.05(1.04)}{0.145-0.04} = \frac{4.212}{0.105} =$ Rs.40.11

b. $D_o = 4.05$

Year	Div	PV@14.5%	PV(Div)
1	4.05 × 1.2 = 4.86	0.873	4.24
2	4.86 × 1.2 = 5.83	0.763	4.45
3	5.83 × 1.2 = 7.00	0.666	4.66
			13.35

$P_3 = \frac{7.00(1.04)}{0.145-0.04} = \frac{7.28}{0.105} = 69.33$

Present value of $P_3 = 69.33 \times PVIF_{14.5, 3}$

= 69.33 × 0.666

= 46.17

Intrinsic value = 46.17 + 13.35 = Rs.59.52.

5. There are a number of strategies that can help limit risk while offering the potential of higher returns.

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- Investing in a variety of investments, or simply following the old adage “Don't put all your eggs in one basket.” With a portfolio spread among several different investments, you benefit when each type is doing well, and also limit exposure when one or more investment is performing poorly.
- Building upon the diversification concept, with asset allocation you create a customized portfolio consisting of several asset categories (cash, stocks, bonds) rather than individual securities. Changing economic conditions affect various types of assets differently; consequently, each asset category's return may partially offset the others'.

Systematically investing a fixed amount at regular time intervals. When this disciplined program is adhered to and market fluctuations are ignored, it attempts to “smooth out” the ups and downs of the market over the long haul. Dollar cost averaging, however, cannot guarantee a positive return in a declining market and you must consider your ability to continue investing on a regular basis under all market conditions.

6. Diversification can help to reduce portfolio risk by eliminating un-systematic risk for which investors are not rewarded. Investors are rewarded for taking market risk. Because diversification averages the returns of the assets

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within the portfolio. >

Diversification can help reduce risk by eliminating unsystematic risk from a portfolio. By choosing securities of different companies in different industries, one can minimize the risks associated with a particular company's "bad luck." By diversifying among asset classes that are negatively or weakly correlated, you further reduce the volatility of your portfolio.

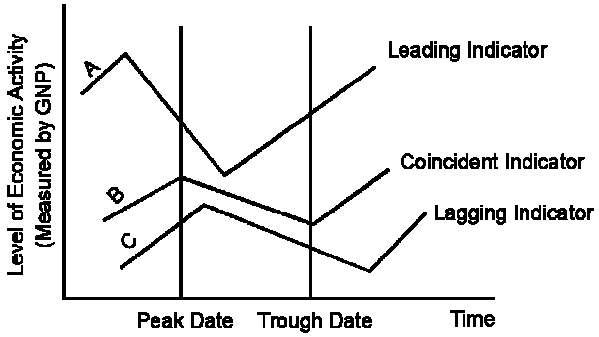
However, diversification can reduce the return of the portfolio as well. By selecting several assets, the overall return on portfolio will be the weighted average of the returns of those assets. For example, let us look at a portfolio made up 50/50 of single stock and a single bond. In one year, the stock has a total return 30%, the bond 6%. The portfolio return will only be 18% (36 divided by 2). Whereas, if the entire portfolio was invested in the stock, the return would have been 30%.

Section C: Applied Theory

7. The important forecasting techniques are: < TOP >

a. **Leading Indicator approach**

The lead indicator approach attempts to forecast the general economic conditions by identifying economic indicators that turn ahead of the change in the general level of economic activity. Economic indicators are nothing but time series which tend to turn up or down in advance of or concurrent with, or after the economic upturn or downturn. From figure given below, we find that indicator A turns ahead of the peak and trough of the business cycle whereas indicators B and C turn in unison with or after the peak and trough of the cycle.



So, to forecast the change in the economic conditions, we will be obviously interested in leading indicators because they provide advance signals of the turning points in the economic activity.

While identifying a lead indicator for the purposes of forecasting, the analyst must ensure that the lead indicator fulfills the following criteria as closely as possible: (1) It should move smoothly from one period to another as it rises or falls and should turn sharply at its peaks and troughs. If a series zigzags during its upward or downward swings, it becomes difficult to know whether the 'zig' is a genuine turning point or a temporary reversal of trend. (2) An ideal lead indicator should always lead turning points of general business activity by the same number of months with no `false' leads. (False leads are predictions of business turning points which do not materialize). (3) It should lead by enough time to permit the user to make necessary alterations in his plans, but do not lead by a long- time interval that will make him disbelieve the indicator. (4) The indicator should fit logically with the business cycle theory. The more logical it appears that a particular series will turn ahead of economic conditions, the more assured the user can be that its historical lead relationship will continue in the future.

Some of the leading economic indicators are the utilization of manufacturing capacity, residential construction, corporate profits, and of course the general level of stock prices. Since the movement in the general level of stock prices is what we are ultimately interested in forecasting, we should look for that leading indicator which would act as a lead to the leading indicator under consideration.

The lead indicator approach is most valuable in suggesting the direction of change in economic activity. But it does not convey any information on the magnitude and duration of the change. The other important limitation of this approach is that the signals provided by the different lead indicators can be mixed. In other words, some of the leading series

might signal a turn while the others might not, resulting in a serious problem of interpreting the same for the purpose of arriving at a forecast.

This limitation can of course be resolved by shortlisting only such lead indicator(s) that satisfy the criteria mentioned above. The diffusion index approach discussed in the next section partly attempts to resolve the problem of mixed signals.

b. **Diffusion Indices**

A diffusion index (as the name implies) is a measure of how widespread (diffused) a phenomenon is. We can set up a diffusion index for leading indicators by counting the number of indicators that rise during a particular period and expressing it as a proportion of the total number of lead indicators and more desirably in a percentage form. If five out of, say, ten leading indicators rise during a particular month, the diffusion index for that month will be 50 percent. If, in the next month, seven rise (not necessarily including all the five which rose in the previous month), the index for that month will be 70 percent. The user must interpret the diffusion index relative to the levels of the index in the past. Certainly a rise from 50% to 70% in the index is a stronger confirmation of a period of economic advance.

c. **Econometric Model Building Approach**

As far as short-term economic forecasting is concerned, an approach based on econometric methods has the advantage of providing a magnitude and direction to the dependent variable (unlike the lead indicator approach), say GNP. However, the user must understand that a precise estimate of the dependent variable (forecast value for GNP) obtained from the econometric model need not be an accurate one, because accuracy of the forecast will ultimately depend upon the quality of data input, the validity of the assumptions underlying the model, and above all upon the model builder's understanding of the underlying economic theory.

Further, as stated in the Indian context it must be noted that, an econometric model for forecasting GNP in a planned economy may not have much of a practical relevance because the planning priorities may change significantly, besides the likely changes in government regulation, fiscal policy, and the control mechanisms of money, credit, prices and wages. Econometric models can be meaningful for future projections if and only if the estimated co-efficients (like the intercept 'a' and slope 'b' in a linear regression model) are found to be acceptable in respect of their stability over time.

d. **GNP Model Building Approach**

The GNP model building approach forecasts GNP in the short-run by estimating the magnitudes of the various components constituting GNP. If GNP is defined as C + I + G + X – M where C, I, G, X and M stand for their standard definitions, then forecast for GNP under this approach is determined by estimating the likely values of C, I, G, X and M. To estimate these components, the forecaster relies extensively on the budget estimates of the Central and State Governments, the socio-economic surveys carried out by the Government and private agencies, and the field data collected for this purpose.

Once the forecaster estimates these major components, he adds them together to come up with his estimate of the GNP. He tests the forecast for internal consistency because of the interrelatedness of the GNP accounts. For example, a given level of consumption implies a certain level of savings, which affects business investments which in turn affects production activities, and thus affects income and savings.

While these circular effects take place, other factors like interest rates and inflation will also be affected. So, the forecaster must ensure that his estimates for the different components take care of such inter linkage. Apart from testing the forecast for internal consistency, the forecaster also examines it for external consistency by comparing it with forecasts obtained under other methods like the econometric model building approach.

The major advantage of this approach is its versatility. Since the GNP forecast is adjusted for all anticipated changes and tested for internal consistency, it is likely to be a reliable one. But the approach is data demanding and calls for a vast deal of judgment and ingenuity. The approach has been succinctly described by Lewis and Turner as `an effort to build a view of the short-run business outlook that is comprehensive, that is as quantitatively precise as the state of our knowledge permits, that is internally consistent, that draws upon rather than sidesteps all the pertinent insights of modern aggregative economics but, at the same time, does not make a fetish of the theoretical rigor. Instead, the technique seeks to exploit any and all evidences of

business prospects that may come to hand. It is particularly distinguished from pure econometric model building by its heavy use of data concerning the advance plans and commitments of certain spending groups, and it retains a sizeable place for judgment and free-hand adjustments'.

8. Characteristics of Real Estate/Property Markets

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Valuation of real estate portfolio is different from that of bonds or stocks because of the following characteristics:

a. **Each packet is Unique:** No two real estate investments can be the same, at least if they are located in different places. This difference may not be very significant but the price of one of them may not give any clue about the price of another. Thus the principle of pricing of similar products cannot be applied to real estate pricing.

b. **Relatively Fewer Players in the Markets:** While there are a large number of players in the stock market or bond market, there are a very few players in the property market. This is because the amount required for investment in property markets is comparatively higher than that required in the other asset markets.

c. **The Price of a Property is Influential:** In a perfectly competitive market, buyers cannot determine the price. Buyers have no choice. But the situation is different in the case of real estate markets because a buyer who can bid for a much higher price than the second bidder will definitely influence the price of the property. Real estate does not have a market mechanism which allows short selling.

d. **Real Estate Investment are Large Economic Units:** Property investments cannot be divided into smaller units like equity shares. This may be overcome to a certain extent by way of securitization of real estate investments. But still a property investment must be made as a single unit.

e. **Extensive Government Controls:** Property markets are subject to several regulations such as tax laws, building codes, environmental norms to be adhered to, etc. These act as detrimental factors to the development of real estate. Frequent changes in government regulations may cause change in ownership position of a real estate which poses an additional risk.

f. **Slow Reaction of Supply to Demand:** Supply and demand in real estate do not balance. This is because it takes time for conversion of a property from one use to another use. This adds to the complication of the valuation of an investment**.**

g. **Unorganized Market:** There is no regulated market available for real estate. So the price of the real estate becomes difficult to be estimated. Though the shares in Real Estate Investment Trusts (REITS) are traded, they do assume the properties of a share rather than those of a real estate.

h. **Insufficient Data about Market Prices:** Absence of an organized market and indivisible nature of real estate investment are the reasons for the availability of reliable information about the prices of real estate. Even the buyers and sellers are not willing to disburse the price information. Unless lease agreement is signed, it is not possible to estimate the price of a vacant space in any building. Thus, price information about the property is difficult to obtain.

i. **Illiquid Nature:** Very few transactions occur in real estate over a period of time. So a definite trend of the prices over time is difficult to determine. The risk and return characteristics are also difficult to estimate.

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