

Investment Management

New Syllabus

Course Title: Investment Management

Course No. FIN 633

Nature of the Course: Specialization

Duration of the Course: 100 lecture hours

Duration of the Class: 60 minutes

Full Marks: 100

Pass Marks: 40

Course Objectives

The course aims to provide the students with knowledge of concept and principles of investment and develop analytical skills for appraisal of securities and management of investible funds from the viewpoint of investors, individuals as well as institutions, particularly in the context of Nepal.

Course Description

This course provides a broad overview of investment environment, trading of securities in financial market, mutual fund and other investment companies, risk aversion, capital allocation and optimal risky portfolios, equilibrium in capital market and market efficiency, fixed income securities analysis, common stock analysis, option, future and other derivatives, active portfolio management, risk management and hedging. This course also provides an overview of these topics in the context of Nepal.

Course Contents

- Unit 1: Investment Environment** LH 5
The Investment Environment Real assets versus financial assets; financial markets and the economy; Clients of the financial system; Environmental response to clientele demands; Market and market structure; ongoing trends.
- Unit 2: Financial Market and Trading of Securities** LH 10
Market and Instruments: The money market; The fixed-income capital market; Equities securities; Stock and bond market indexes; Derivative markets; Trading of Securities: Issue of securities; Markets for trading securities; Trading on exchanges; Trading on the OTC market; Trading costs; Buying on margin; Short sales; Regulation of securities markets.
- Unit 3: Mutual Funds and Other Investment Companies** LH 5
Mutual Funds and Other Investment Companies: Investment companies; Types of investment companies; Mutual funds; Costs of investing in mutual funds; Taxation of mutual fund income; Mutual fund investment performance; Information on mutual funds.
- Unit 4: Risk Aversion, Capital Allocation and Optimal Risky Portfolios** LH 10
Risk Aversion: Risk and risk aversion; Portfolio risk; Capital Allocation between the Risky asset and the Risk-free Asset: Capital allocation across risky and riskfree portfolios; The risk-free asset; Portfolio on one risky asset and one risk-free asset; Risk tolerance and asset allocation; Passive strategies; The capital market line; Optimal Risky Portfolios: Diversification and portfolio risk; Portfolio of two risky assets; Assets allocation with stocks, bonds, and bills; The Markowitz portfolio selection model; Optimal portfolio with restrictions on the risk-free asset.
- Unit 5: Equilibrium in Capital Market and Market Efficiency** LH 20
The Capital Asset Pricing Model: Introduction; Extensions of the CAPM; The CAPM and Liquidity; Single-Index and Multifactor Models: A single-index security market; Constructing optimal portfolio using Sharp's single index model; The CAPM and the index model; The industry version of the index model; Multifactor models; Arbitrage Pricing Theory: Arbitrage opportunities and profits; The APT and well-diversified portfolios; Individual assets and the APT; The APT and the CAPM; A multifactor APT; Market Efficiency Random walk and the efficient market hypothesis (EMH); Implications of the EMH for investment policy; Event studies.
- Unit 6: Fixed-Income Securities Analysis** LH 15
Bond Prices and Yields: Bond characteristics; Default risk; Bond pricing; Bond yields; Bond prices over time; The Term Structure of Interest Rates: The term structure under certainty; Measuring the term structure; Interest rate uncertainty and forward rates; Theories of the term structure; Interpreting the term structure; Fixed-Income Portfolio Management: Interest rate risk; Passive bond management; Convexity; Active bond management; Interest rate swaps; Financial engineering and interest-rate derivatives.

Unit 7: Common Stock Analysis LH 10

Macroeconomic and Industry Analysis: The global economy; The domestic Macro-economy; Demand and supply shocks; Government policy; Business cycles; Industry analysis; Equity Valuation Models: Balance sheet valuation methods; Intrinsic value versus market price; Dividend discount models; Price-Earning ratio; Corporate finance and the free cash flow approach; Inflation and equity valuation; Behaviour of the aggregate stock market.

Unit 8: Options, Futures and Other Derivatives LH 10

Options Markets: Introduction; The option contract; Values of options at Expiration; Option strategies; The put-call parity relationship; Option like securities; Financial engineering; exotic option; Option Valuation: Introduction; Restriction on option values; Binomial option pricing; Black-Scholes option valuation; Black-Scholes formula and hedge ratio; Futures Markets: The future contract; Mechanics of trading in futures markets; Futures markets strategies; The determination of futures prices; Future prices versus expected spot prices.

Unit 9: Active Portfolio Management LH 10

Portfolio Performance Evaluation: Measuring investment returns; The conventional theory of performance evaluation; Performance measurement with changing portfolio composition; Market timing; Performance attribution procedures; Evaluating performance evaluation; The process of Portfolio Management: Making investment decision; Constraints; Asset allocation; Making portfolio of individual investor.

Unit 10: Risk Management and Hedging LH 5

Risk Management and Hedging: Hedging techniques; Effects of hedging demands on capital market equilibrium.

Basic Readings

- Bodie, Z., Alex K., and Alan J. M. (2006). **Investments**, Boston: Irwin
 Reilly, Frank K. and Keith, C.B. (2008). **Investment Analysis and Portfolio Management**.
 Singapore: Thomson South-Western.
 Sharpe, W.F., Gordon J.A., and Jeffery V.B. (2004). **Investments**, New Delhi: Prentice Hall of India Ltd.

Supplementary Readings

- Annual reports of SEBON and NEPSE
 Bhalla, V.K. (2007). **Investment Management**. New Delhi: S. Chand and Co.
 Bhattarai, P. (2004). **The Nepalese Financial System**. Kathmandu: Asmita Books Publishers and Distributors.
 Fabozzi, F.K. (2004). **Investment Management**. New Jersey: Prentice Hall Inc.
 Fisher, D.E. and Jordon, D.E. (1994). **Security Analysis and Portfolio Management**. New Delhi: Prentice Hall of India
 Francis, J.C. (1992). **Investments: Analysis and Management**. New York: McGraw Hill.
 Haugen, R.A. (1997). **Modern Investment Theory**. New Jersey: Prentice-Hall Inc.
 Jonesa, C.P. (2004). **Investment: Analysts and Management**. Singapore: John Wily and Sons.
 Latane, H.B., Donald I., Tuttle, and Charles, P.J. (2002). **Security Analysis and Portfolio Management**. New York: The Ronald Pres Company.
 Mayo, H.13. (2006). **Investment An Introduction**. Singapore: Thompson South- Western.
 Reilly, F.K. (1990). **Investment Analysis and Portfolio Management** New York: The Dryden Press.
 Shrestha, M.K. (1986). **Securities Exchange Centre: Problems and Prospects**. Kathmandu: United Dynamic Research and Consultancy.
 Winger, B.J. and Ralph, R.F. (1982). **Investment**. New York: Macmillan Publishing Company.

New Model Questions - 2067 (SET I)**Time 4 hrs****Full marks 100**

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Group A: Short answer questions**Attempt any SIX questions.**

1. What is investment? Describe briefly the investment environment in Nepal.
2. What is hedge fund? Describe general principles of hedging.

[60]

[4+6]

[5+5]

3. State whether the following statements are true or false. Give reasons for your answer.
- Suppose you have submitted an order to buy a stock which is quoted as 55.25 (bid) and 55.50 (asked). Given the quotes, your trade is executed at 55.25.
 - Consider a mutual fund that manages a portfolio of securities worth Rs 120 million. Suppose the fund owes Rs 4 million to its investment advisers and owes another Rs 1 million for rent, wages due, and miscellaneous expenses. The fund has 5 million shares outstanding. The net asset value is Rs 23 per share.
 - Total risk consists of systematic risk and market risk.
 - Call options are right to buy stocks at market price.

[4*2.5]

Ans: (i) T (ii) T (iii) F (iv) F

[5+5]

4. Write short notes on (Any TWO)

- Active bond management
- Futures contract
- Securities Board of Nepal

5. The composition of Kumari Fund portfolio as on 1st January 2010 was as follows:

| Stock | Shares | Price |
|-------|---------|-------|
| A | 200,000 | Rs 35 |
| B | 300,000 | 40 |
| C | 400,000 | 20 |
| D | 600,000 | 25 |

- The fund had not borrowed any funds, but its accrued management fee with the portfolio manager totaled Rs 30,000. There were 4 million shares outstanding. What was the net asset value of the fund on 1st January 2010? What is the significance of net asset value for the investor?
- If during the year the portfolio manager sold all of the holdings of stock D and replaced it with 200,000 shares of stock E at Rs 50 per share and 200,000 shares of stock F at Rs 25 per share, what was the portfolio turnover rate? What does portfolio turnover rate signify?
- By the year-end 2010 the net asset value equaled Rs 12.10. The fund paid year-end distribution of income and capital gain of Rs 1.50. What was the rate of return to an investor in the fund?

[4+4+2]

Ans: (i) Rs 10.4925 per share (ii) 35.7% (iii) 29.62%

6. Consider the following information about a risky portfolio that you manage, and a risk-free asset: $E(R_p) = 11$ percent, $\sigma_p = 15$ percent, $R_f = 5$ percent.

- Your client wants to invest a proportion of her total investment budget in your risky fund to provide an expected rate of return on her overall or complete portfolio equal to 8 percent. What proportion should she invest in the risky portfolio, P , and what proportion in the risk-free asset?
- What will be the standard deviation of the rate of return on her portfolio?
- Another client wants the highest return possible subject to the constraint that you limit his standard deviation to be no more than 12 percent. Which client is more risk averse and why?

[4+4+2]

Ans: (i) 50% (ii) 7.5%

7. You apply Dupont system of financial analysis to the following data for ABC Ltd.

| | |
|-------------------------------|-------|
| Leverage ratio (asset/equity) | 2.2 |
| Total asset turnover | 2.0 |
| Net profit margin | 5.5% |
| Dividend payout ratio | 31.8% |

- What is ABC's return on equity?
- ABC Ltd and another company XYZ Ltd have the same return on asset (ROA), yet ABC's return on equity is higher. How can you explain this?
- ABC Ltd has a profit margin on sales below the industry average, yet its return on asset (ROA) is above the industry average. What does this imply about its asset turnover?

[5+2.5+2.5]

Ans: (a) 24.2%

8. Suppose that Infotek currently is selling at Rs 40 per share. You buy 500 shares using Rs 15,000 of your own money, borrowing the remainder of the purchase price from the broker. The rate on the margin is 8 percent.
- What is the percentage increase in the net worth of your brokerage account if the price of Intel immediately changes to: (a) Rs 44; (b) Rs 40; (c) Rs 36? What is the relationship between your percentage return and the percentage change in the price of Intel?
 - If the maintenance margin is 25 percent, how low can Infotek's price fall before you get a margin call?
 - How would your answer to 'ii' change if you had financed the initial purchase with only Rs 10,000 of your own money? [5+2.5+2.5]

Ans: (i) a. Rs 17,000; 13.33% b. no change; 0% c. Rs. 13,000; -13.33% (ii) Rs 11.33 (iii) Rs 26.67

Group B: Comprehensive answer questions

Attempt any TWO questions

[40]

9. What is portfolio performance evaluation? Describe the conventional theory of performance evaluation. [20]
10. XYZ Ltd has issued various bonds with the following characteristics.
 Bond A carries 8 percent coupon and pays interest semiannually. The bond is selling at Rs 990 in the market.
 Bond B is 8 percent, 5-year maturity bond paying 10 semiannual coupon payments of Rs 40 each.
 Bond C is 8 percent coupon, 30-year maturity bond and it is selling at Rs 1,276.76.
 Bond D is a 3-year zero coupon bond.
- What will be the invoice price of Bond A if the last coupon was paid 30 days ago? (use 182 days in a half-year)
 - What is the value of Bond B?
 - What rate of return would be earned by an investor by purchasing Bond C at Rs 1,276.76?
 - What is the duration of Bond B if the yield to maturity is 10 percent?
 - Suppose you must make a payment of Rs 14,641 in four years. The market interest rate is 10 percent, so the present value of obligation is Rs 10,000. You wish to fund the obligation using Bond B and Bond D (i. e. invest in Bond B and Bond D now and pay the obligation in four years using the proceeds from bonds). How much you should invest in Bond B and Bond D to immunize the obligation? (2+3+5+5)
11. (a) Suppose the rate of return on short-term government securities (perceived as risk-free) is about 5 percent. Suppose also that the expected rate of return required by the market for a portfolio with a beta of 1 is 12 percent. According to the capital assets pricing model:
- What is the expected rate of return on the market portfolio?
 - What would be the expected rate of return in a stock with $\beta = 0$?
 - Suppose you consider buying a share of stock at Rs 40. The stock is expected to pay Rs 3 dividends next year and you expect it to sell then for Rs 41. The stock risk has been evaluated at $\beta = -.5$. Is the stock overpriced or underpriced?

Ans: (a) (i) 12% (ii) 5% (iii) Since expected return on the stock (10%) is greater than the required return (8.5%), the stock is underpriced.

- (b) Suppose that there are two independent economic factors, F_1 and F_2 . The risk-free rate is 6 percent, and all stocks have independent firm-specific components with a standard deviation of 45 percent. The following are well-diversified portfolios:

| Portfolios | Beta on F_1 | Beta on F_2 | Expected returns |
|------------|---------------|---------------|------------------|
| A | 1.5 | 2.0 | 31% |
| B | 2.2 | -0.2 | 27% |

What is the expected return-beta relationship in the economy?

[10+10]

Ans: $E(R_p) = R_f + 10\beta_{p1} + 5\beta_{p2}$

New Model Questions- 2067 (SET II)

Time 4 hrs

Full marks 100

Group A: Short answer questions

Attempt any SIX questions.

[60]

- Discuss risk return characteristics of government securities. If you like to trade in 'Development Bonds' issued by Nepal Government, how would you proceed to buy or sell them? [10]
- What is mutual fund? What are the important costs associated with investing in mutual funds? [4+6]
- State whether the following statements are true or false. Give reasons for your answer.
 - Commercial papers are widely used to finance short-term financial needs of firms in Nepal.
 - Nepal Stock Exchange is the regulator of financial markets in Nepal.
 - Put options are rights to sell common stocks at predetermined price within specified period.
 - Sharpe portfolio performance measure is calculated by dividing the difference between the mean return of the portfolio and the risk-free rate by beta of the portfolio. [4×2.5]

Ans: (i) F (ii) F (iii) T (iv) F

[5+5]

4. Write short notes on (Any TWO)

- Capital allocation line
 - Pension fund
 - Hedging techniques
- Through a margin account, Mr Sharma short sells 200 shares of Shrestha Inc. stock for Rs 50 per share. The initial margin requirement is 45 percent.
 - If Shrestha Inc stock subsequently rises to Rs 58 per share, what is the actual margin in Sharma's account?
 - If Shrestha Inc stock subsequently falls to Rs 42 per share, what is the actual margin in Sharma's account?
 - Calculate Sharma's rate of return in parts (i) and (ii) assuming that the short loan was flat but the initial margin deposit earned interest at a rate of 8 percent and that the prices of Rs 58 and Rs 42 were observed after one year during which the firm did not pay any dividend.

Ans: (a) Rs. 2,900 (b) Rs. 6,100 (c) (i) -27.56% (ii) 43.56%

- Given that the expected return on the market portfolio is 10 percent, the risk-free rate of return is 6 percent, the beta of stock A is 0.85 and the beta of stock B is 1.20.
 - Draw the Security Market Line (SML).
 - What is the equation for the SML?
 - What are the equilibrium expected returns for stocks A and B?
 - Plot the two risky securities on the SML. [4*2.5]

Ans: (i) $E(r_A) = 6\% + [10\% - 6\%] \beta_A$; $E(r_B) = 6\% + [10\% - 6\%] \beta_B$ (iii) 9.4% and 10.8%

- Binod recently purchased a bond with a Rs 1,000 face value, a 10 percent coupon rate, and four years to maturity. The bond makes annual interest payments, the first to be received one year from today. Binod paid Rs 1,032.40 for the bond.
 - What is the bond's yield to maturity?
 - If the bond can be called two years from now at a price of Rs 1,100, what is its yield-to-call? [5+5]

Ans: (i) 8.99% (ii) 12.76%

- HP stock is currently priced at Rs 400 per share. Six months from now its price will be either Rs 442.1 or Rs 361.9. If the price rises to Rs 442.1, then six months later the price will be either Rs 488.6 or Rs 400. If, however, the price initially falls to Rs 361.9, then six months later the price will be either Rs 400 or Rs 327.5. The risk-free rate (continuously compounded) is 3.05 percent over each six-month period. Using the binomial option pricing model, what is the fair value of a one-year call option on HP stock? [10]

Ans: Rs. 33.0424

Group B: Comprehensive answer questions

Attempt any TWO questions

[40]

- "The notion that stocks already reflect all available information is referred to as the efficient market hypothesis". Elucidate this statement and state the different versions of efficient market hypothesis. [20]

10. You manage a risky portfolio with expected rate of return of 18 percent and standard deviation of 28 percent. The T-bill rate is 8 percent.
- Your client chooses to invest 70 percent of a portfolio in your fund and 30 percent in a T-bill money market fund. What is the expected value and standard deviation of the rate of return on his portfolio?
 - Suppose that your risky portfolio includes the following investments in the given proportions: Stock A 25 percent, Stock B 32 percent, Stock C 43 percent. What are the investment proportions of your client's overall portfolio including the position of T-bill?
 - Suppose stocks A, B and C have beta 1.2, 2.5 and 0.8 respectively. What is the beta of your client's overall portfolio including the T-bill?
 - What is the reward-to-volatility ratio (S) of your risky portfolio? Your client's?
 - Your client's degree of risk aversion is $A = 3.5$. What proportion, y , of total investment should be invested in your fund? And what is the expected value and standard deviation of the rate of return on your client's optimized portfolio? [5*4]

Ans: (i) 15% and 19.60% (ii) 15.5%; 22.4%; 30.1%; 30% (iii) 0.9868 (iv) 0.3571 (v) 52%; 11.64% and 10.19%

11. The market consensus is that Everest Electronic Corporation has an ROE = 9 percent, has a beta of 1.25, and plans to maintain indefinitely its traditional plowback ratio of 2/3. This year's earnings were \$3 per share. The annual dividend was just paid. The consensus estimate of the coming year's market return is 14 percent, and T-bill currently offer a 6 percent return.
- Find the price at which Analog stock should sell.
 - Calculate the P/E ratio.
 - Calculate the present value of growth opportunities.
 - Suppose your research convinces you Analog will announce momentarily that it will immediately reduce its plowback ratio to 1/3. Find the intrinsic value of the stock.
 - The market is still unaware of this decision. Explain why V_0 no longer equals P_0 and why V_0 is greater or less than P_0 . [5*4]

Ans: (i) Rs 10.60 (ii) 3.33 (iii) -Rs 9.275 (iv) Rs 15.85

PART I. INTRODUCTION

1. INVESTMENT ENVIRONMENT

1. 2070 Q.No. 1

Discuss the investment environment in Nepal.

[10]

2. 2070 Old Q.No. 1

Explain the recent changes in the investment environment of Nepal. Explain how do these changes affect individual investors like you.

[10]

3. 2069 Q.No. 2

Discuss important considerations in the process of portfolio management.

[10]

4. 2069 Q.No. 9

What are the trends in contemporary investment environment? Also describe the role of regulator in the development of securities markets in Nepal.

[10+ 10]

5. 2069 Old Q.No. 1

Do you think that Nepalese investors are informative and analytical while making investment decision in securities market of Nepal? Explain.

[10]

6. 2068 Old Q.No. 1

"The investment process involves taking a series of decisions and actions." Discuss.

[10]

7. 2067 Q.No. 1

What is investment? Describe briefly the important investment alternatives available in Nepal. [5+5]

8. 2067 Q.No. 1 (Old)

What factors might an individual investor take into account in determining his or her investment policy?

[10]

9. 2066 Q.No. 7

Discuss the investment environment in Nepal. And also describe, by giving suitable examples, the investment process an investor should follow while investing in Nepal. [10+10]

10. 2065 Q.No. 7

As an investor, what investment process do you follow while making investment decision? Do you think Nepalese investors follow investment process? Explain.

11. 2064 Q.No. 1

Discuss the asset ownership pattern of the individual investors and what factors govern the individual asset ownership.

12. 2063 Q.No. 1

Define investment process. What steps the investors should consider in setting investment process [10]

13. 2062 Q.No. 1

Explain the investment process which investors should follow while making investment decision in financial securities in Nepal. [10]

14. 2060 Q.No. 1

What do you understand by investment process? Describe the various steps involved in investment process. [10]

15. 2059 Q.No. 1

The investment environment encompasses the kinds of marketable securities that exist and where and how they are bought and sold. Explain. [10]

16. 2058 Q.No. 1

What do you understand by investment policy? What factors might an individual investor take into account in determining his or her investment policy? [10]

2. MARKETS AND INSTRUMENTS

THEORETICAL QUESTIONS

1. 2070 Old Q.No. 2a

Explain the major types of money market instruments with an emphasis on those currently popular in Nepal. [4]

2. 2070 Old Q.No. 3

- a. The Dow theory has been subjected to numerous scientific studies which support its validity. True, false or uncertain. Explain.
- b. Over the past 4 weeks, the Barron's confidence index (BCI) has had the following values:

| Week | BCI |
|------|------|
| 1 | 0.70 |
| 2 | 0.68 |
| 3 | 0.65 |
| 4 | 0.61 |

What do you understand from the above information given? Interpret. [5+5]

3. 2069 Old Q.No. 2a

Briefly explain types of fixed income securities. [5]

4. 2069 Old Q.No. 7

Explain the purpose of various regulations enacted by Nepal Government for regulating securities markets in Nepal. [20]

5. 2068 Q.No. 1

What is market index? Describe how the market index like Npse is constructed. [5+5]

6. 2064 Q.No. 7

In your opinion, what would be the main reasons for the current movements in stock prices with bullish sentiments? Do you think that these unexpected upswings in stock prices are realistic or artificial and in this respect what measures have been taken by the regulating authorities that include both SEBON and NEPSE in controlling and supervising over the activities of brokers?

7. 2061 Q.No. 1

Compare and contrast between NEPSE, and Dow Jones Industrial Average (DJIA). Explain how adjustment is made in calculation of these indexes. [10]

8. 2060 Q.No. 7

'Explain the major types of fixed income securities with an emphasis on those currently popular in Nepal. [20]

9. 2059 Q.No. 7

Explain the major types of money market instruments with an emphasis on those currently popular in Nepal. [20]

10. 2058 Q.No. 7

'Perhaps the most familiar type of fixed income investment is the personal savings account at a bank, savings and Loan Company, or credit unions.' Discuss. [20]

● Write notes on:**11. 2067 Q.No. 6a (Old)**

Derivative securities [5]

12. 2064 Q.No. 6 a

Fixed income securities [5]

13. 2063 Q.No. 6 a

Money market instruments [5]

14. 2059 Q.No. 6 a

Stock market index [5]

15. 2058 Q.No. 6 b

Municipal Bonds [5]

NUMERICAL PROBLEMS**16. 2070 Old Q.No. 2b**

Consider a 13 week Treasury bill, issued today, which is selling for Rs.9500. (Its face value is Rs.10,000). (i) What is the discount yield on 13-week Treasury bill? (ii) What is the equivalent yield of the Treasury bill? What is the yield to maturity? [3×2]

Ans: (b) (i) 19.78% (ii) 21.10% and 22.83%

17. 2069 Q.No. 4

a. Consider the following quotes for Treasury note.

| Rate | Maturity Mo/Yr | Bid | Asked | CHG | Ask yld |
|-------|----------------|-------|-------|-----|---------|
| 4.250 | Nov 13n | 97:29 | 97:30 | +10 | 4.60 |

- If you want to buy this note how much does it cost based on the above quote?
- If you want to sell it, at what price can you sell?
- What does 'CHG +10' indicate?
- Do you need to incur any additional costs to buy or sell bonds?

b. Consider the following quotes for a common stock listed in NYSE.

| Name | Symbol | Close | Net chg | Volume | 52 WK | | Div | Yield | P/E | YTD% change |
|------------------|--------|-------|---------|--------|-------|-------|------|-------|-----|-------------|
| | | | | | High | Low | | | | |
| General Dynamics | GD | 74.59 | 0.17 | 1,497 | 77.98 | 56.68 | 0.92 | 1.2 | 16 | 0.3 |

- What is the closing price of the stock? What was it on the previous trading day?
- Interpret "52 WK High Low". What is its significance to an investor?
- How is dividend yield computed? [5+5]

Ans: (a) (i) Rs. 979.375 per note (ii) Rs. 979.0625 per note (b) (i) Rs. 74.42 per share (iii) 1.2%

18. 2069 Old Q.No. 2b

A T-bill with 83 days until maturity has an asked discount rate of 5.03 percent and a bid discount rate of 5.05 percent. The asked yield to maturity is 5.16 percent and face value is Rs. 10,000.

- Determine the asked price for the T-bill.
- Determine the bid price for the T-bill.
- Prove the asked yield to maturity is 5.16 percent.
- Determine the effective annual rate of return for the T-bill.
- What is the bid-asked spread?

[5]

Ans: (i) Rs. 9,884.0306 (ii) Rs. 9,883.4694 (iii) 5.16% (iv) 5.26% (v) Rs. 0.4612

19. 2069 Old Q.No. 5

Based on the following stock price and shares outstanding information, compute the beginning and ending values for a price-weighted index and market-value-weighted index.

| | Dec 31, 2002 | | Dec 31, 2003 | |
|---------|--------------|-----------------------|--------------|-----------------------|
| | Price | Shares of outstanding | Price | Shares of outstanding |
| Stock K | 20 | 100,000,000 | 32 | 100,000,000 |
| Stock L | 80 | 2,000,000 | 45 | 4,000,000* |
| Stock M | 40 | 25,000,000 | 42 | 25,000,000 |

*Stock split two-for-one during the year.

- Compute the percentage change in the value of each index.
- Explain the difference in results between the two indexes.
- Compute the results for an unweighted index and discuss why these results differ from the others.

[10]

Ans: (a) 19% & 4.11% (c) 10708 points

20. 2068 Old Q.No. 2

Calculate stock price index from the three common stocks listed below. Assume there was no additional issue of share within the periods and any stock dividends or splits. Ignore cash dividend payments when computing the price index. [2.5x4]

| Stocks | Total shares outstanding on both dates | Base period market price July 1, 1996 | Most recent period market price July 1, 2006 | Percentage price change |
|--------|--|---------------------------------------|--|-------------------------|
| MBL | 50,000 | Rs 20 | Rs 60 | +200 |
| NIBL | 10,000 | 40 | 80 | +100 |
| NABIL | 100,000 | 60 | 80 | +33 |
| HBL | 40,000 | 30 | 50 | +67 |

- If the new four stocks index is value weighted, what will be its value on July 1, 2006?
- If the four new stocks index is price weighted, what will be its value on July 1, 2006?
- If new four stocks index is equally weighted, what will be its value on July 1, 2006?
- Compare and contrast the price-weighted, value weighted, and the equally weighted index numbers you obtained from the same four stocks and explain why they differ.

Ans: (i) 160.4651 (ii) 67.50 (iii) 200

21. 2067 Q.No. 5

Consider three stocks X, Y, and Z, with the following closing prices on two particular dates:

| Stock X | Date 1 | Date 2 |
|---------|---------|---------|
| X | Rs. 160 | Rs. 220 |
| Y | 50 | 40 |
| Z | 240 | 300 |

On the 1 there are 100 shares of stock X, 200 shares of stock Y, and 100 shares of stock Z outstanding.

- Construct a price-weighted market index using the three stocks, X, Y, and Z. What is the index value on date 1?
- What is the price-weighted value on date 2?

- c. Assume that, on date 2, the stock X splits 4-for-1. What is the price weighted index's value on that date?
- d. Construct a value-weighted index using the three stocks. Assign the value-weighted index a value of 100 on date 1. What is the index's value on date 2?
- e. If you invest on 100 shares of stock Z on date 1 and sell on date 2, did you perform better or worse than the market? Compare the performance based on value weighted index. [5×2]

Ans: (a) 150; (b) 186.67; (d) 120; (e) 25%; 20%

22. 2066 Q. No. 3

These four common stocks issued no additional shares and had no stock dividends or splits. Ignore cash dividend payments when computing the price index.

| Stock | Total shares outstanding on both dates | Base price market value (July 16, 2000) | More recent period market price (July 16, 2009) |
|---------------------------------|--|---|---|
| Nepal Investment Bank | 60,000 | Rs.100 | Rs.1,600 |
| Standard & Chartered Bank Nepal | 50,000 | 100 | 4,000 |
| Harishiddi Bricks & Tiles | 100,000 | 10 | 3 |
| Butwal Spinning Ltd | 50,000 | 100 | 40 |

- a. Calculate and interpret the value of the index as on July 16, 2009 assuming that the new four-stock index is (i) value-weighted, (ii) price-weighted, and (iii) equally-weighted.
- b. While calculating the indexes we assumed the four stocks (i) issued no additional shares, (ii) had no stock dividends, (iii) had no stock splits, and (iv) ignored cash dividend. State specifically how the relaxation of these assumptions influences/ do not influence the indexes you calculated.

Ans: a. (i) 100 and 1754.7059; (ii) 77.5 and 1410.75; (iii) 100 and 1417.5

23. 2065 Q.No. 3a

You are given the following information regarding prices for stocks of the following firms.

| Stocks | Number of shares | Price (\$) | |
|--------|------------------|------------|-----|
| | | T | T+1 |
| L Corp | 1,000,000 | 60 | 80 |
| K Co | 10,000,000 | 20 | 35 |
| M Ltd. | 30,000,000 | 189 | 25 |

- i. Construct a price-weighted index for these three stocks, and compute the percentage in the series for the period from T to T+1.
- ii. Construct a market-value-weighted index for these three stocks, and compute the percentage change in the series for the period from T to T+1.
- iii. Construct an equal-weighted index by assuming \$ 1,000 is invested in each stock. What is the percentage change in wealth for this equal-weighted portfolio?
- iv. Briefly discuss the difference in the results for the three stock indexes.

Ans: (i) $PWI_T = 89.67$; $PWI_{T+1} = 46.67\%$; change = -47.95%

(ii) $VWI_T = 100$; $VWI_{T+1} = 19.8988$; change = -80.10% (iii) $EWI_T = 100$; $EWI_{T+1} = 107.1867$; change = 7.1867%

24. 2064 Q.No. 3

Based on the following stock price and shares outstanding information, compute the price-weighted index, value-weighted index and equally weighted index.

| Stock | 2004 | | 2005 | |
|-------|---------|---------|---------|---------|
| | Price | Shares | Price | Shares |
| X | Rs. 300 | 600,000 | Rs. 450 | 600,000 |
| Y | Rs. 250 | 200,000 | Rs. 800 | 200,000 |
| Z | Rs. 650 | 900,000 | Rs. 850 | 900,000 |

Also find the percentage change in the index in case of price weighted and value weighted index. Assuming the beginning value index in each case is 100.

Ans: Price weighted index: For 2004 = 400, For 2005 = 700; 100, 146.6258; 100.2567%; Percentage change = 46.63% Value weighted index: For 2004 = 100, for 2005 = Rs. 146.6258, Equally weighted index = 100.2567, Percentage change in price weighted index = 75%; Percentage change in value weighted index = 46.63%

25. 2063 Q.No. 2

Following is the market information for the securities of three companies:

| Year | Market price | | | Shares outstanding | | |
|------|--------------|------|-------|--------------------|------|-------|
| | Alpha | Beta | Delta | Alpha | Beta | Delta |
| 2004 | Rs. 5 | 40 | 35 | 1000 | 3000 | 2000 |
| 2005 | 2 | 40 | 30 | 3000 | 3000 | 2000 |
| 2006 | 2 | 45 | 33 | 3000 | 3000 | 2000 |

There has been 3-for-1 stock split in Alpha stock during 2004.

- Determine price weighted index for each year using Dow-Jones Industrial Average (DJIA) rating 2004 as the base.
- Define value-weighted index for each year using standard and poor's index (S&P) with base value of 10.
- What is the returns for stock in 2005 and 2006 based on price-weighted and value-weighted index? [10]

Ans: (i) 26.67; 25.09 & 27.87 (ii) 10; 9.54; 10.62 (iii) -5.92%; 11.08% and -4.6%; 11.32%

26. 2062 Q.No. 2 (b)

Calculate a stock price index from the four common stocks listed below. Four stocks issued no additional shares and had no stock dividend and stock splits. [5]

| Stock | A | B | C | D |
|---------------------------------------|--------|--------|---------|--------|
| Total shares outstanding on both date | 50,000 | 10,000 | 100,000 | 40,000 |
| Base year market price on 1/1/1994 | 60 | 20 | 40 | 80 |
| Current market price on 1/1/2004 | 80 | 40 | 70 | 60 |
| Percentage price change | 33.33 | 100.0 | 75.0 | (25.0) |

If new four stock indexes is value weighted, what will be the value weighted index on 1/1/2004 and interpret the result.

Ans: 32.69%

27. 2062 Q.No. 5 (b)

Consider a 90-days Rs. 10,000 T-bill, issued today by Nepal Rastra Bank, which is sold for Rs.9,850.

- What is the annual discount based on the selling price of the security?
- What is the annual equivalent yield of the security? [5]

Ans: (a) 6% (b) 6.18%

3. TRADING OF SECURITIES**1. 2070 Old Q.No. 4a**

Are short sellers primarily risk-taking speculators or risk-averse hedgers? Explain.

2. 2070 Old Q.No. 7

Government of Nepal has enacted a number of status regulating security markets in Nepal. What are the implications of government intervention in the security markets? [20]

3. 2068 Old Q.No. 3a

What economic events separate a bull market from a bear market? [4]

4. 2068 Old Q.No. 7b

Explain the steps taken by SEBO in the primary market to protect the interest of investors. What do you suggest for the improvement of performance of SEBO? [10]

5. 2065 Q.No. 1

What procedures you have to follow while buying and selling securities in Nepal Stock Exchange? Explain.

6. 2065 Q.No. 2a

Distinguish between initial margin and maintenance margin requirements.

7. 2063 Q.No. 3

How investors exercise the long and short positions in making buy-sell decision rules? [10]

8. 2063 Q.No. 7

In your view, how SEBO activities have been proving effective in proper regulation of securities market in Nepal? In this regard, what improvement you think is essential to strengthen the monitoring and compliance of securities laws. [20]

9. 2062 Q.No. 7 (b)

Discuss the advantages and disadvantages of different types of orders which investors make to the brokers in share trading. [10]

10. 2061 Q.No. 7

Discuss the functions of investment bankers in Nepalese capital market and what regulatory measures are taken by Securities Board to control investment bankers? [20]

11. 2060 Q.No. 2

Discuss the characteristics of secondary markets. [10]

12. 2059 Q.No. 2

Discuss the reasons why a corporation might desire to have its stock listed on the stock exchange markets. [10]

13. 2058 Q.No. 2

Describe the functions of commission brokers, floor brokers, and floor traders. [10]

● Write notes on:

14. 2070 Old Q.No. 6a/ 2058 Q.No. 6 a

Over-the-counter market [5]

15. 2069 Old Q.No. 6b

Short sales [5]

16. 2064 Q.No. 6 b

Margin trading

17. 2062 Q.No. 6 b

Security market in Nepal [5]

18. 2061 Q.No. 6 b /2067 Q.No. 6c (Old)

Securities Board of Nepal [5]

NUMERICAL PROBLEMS

19. 2070 Old Q.No. 4b

Mrs. Tuku Kumari buys on margin 1,000 shares of Yak & Yeti Hotel stock at Rs.60 per share. The initial margin requirement is 50% and the maintenance margin requirement is 30%. If the Yak & Yeti stock falls to Rs.50, will Tuku Kumari receive a margin call? [5+5=10]

Ans: Trigger price = Rs. 42.86; No.

20. 2069 Old Q.No. 4b

Mr. Yogendra bought on margin 500 shares of Everest Bank Limited at Rs. 3.50 per share. The initial margin requirement is 45% and the annual interest on margin loans is 12%. Over the next year the stock rises to Rs. 400. What is Yogendra's return on investment? [5]

Ans: 25159.9365%

21. 2068 Q.No. 4

Suppose that Intel currently is selling at \$40 per share. You buy 500 shares using \$15,000 of your own money, borrowing the remainder of the purchase price from your broker. The rate on the margin loan is 8 percent. [4+3+3]

- What is the percentage increase in the net worth of your brokerage account if the price of Intel immediately changes to: (i) \$44, (ii) \$40, and (iii) \$36?
- If the maintenance margin is 25 percent, how long can Intel's price fall before you get a margin call?
- How would your answer to 'b' change if you had financed the initial purchase with only \$10,000 of your own money?

Ans: (i) a. Rs 17,000; 13.33% b. no change; 0% c.Rs. 13,000; -13.33% (ii) Rs 11.33 (iii) Rs 26.67

22. 2067 Q.No. 4

You are bullish on Telecom stock. The current market price is Rs.500 per share, and you have Rs. 50,000 of your own to invest. You borrow an additional Rs. 50,000 from your broker at an interest rate of 8 percent per year and invest Rs. 100,000 in the stock.

- What will be your rate of return if the price of Telecom stock goes up by 10 percent during the next year? (Ignore the expected dividend.)
- How far does the price of Telecom stock have to fall for you to get a margin call if the maintenance margin is 30 percent? Assume the price fall happens immediately.
- Suppose you are bearish on Telecom and decide to sell short 100 shares at the current market price of Rs. 500 per share.
 - How much in cash of securities must you put into your brokerage account if the broker's initial margin requirement is 50 percent of the value of the short position?
 - How high can the prices of stock go before you get a margin call if the maintenance margin is 30 percent of the value of short position? [2.5+2.5+5]

Ans: (a) 12% (b) Rs. 357,1429 (c) Rs 25,000 and Rs. 576.9231

23. 2067 Q.No. 3 (Old)

Securities Board of Nepal (SEBON) is planning to allow stock trading on margin account. Initially, SEBON wishes to regulate initial margin and maintenance margin, hence has proposed 65 percent initial margin and 35 percent maintenance margin.

Suppose you want to open an account with your broker and buy 300 stocks of Salt Trading Corporation (STC) at Rs. 500 each.

- How much must you deposit with the broker and how much you can borrow from the broker to buy the stock of STC on margin account?
- How much can the price of STC stock decline before a margin call is required?
- If the price of STC stock falls to Rs. 150, how much must you deposit in your brokerage account to maintain the minimum margin requirement?
- Why investors buy stocks in margin? [4×2.5=10]

Ans: (a) Rs 97,500; Rs 52,500 (b) Rs 230.7692 (c) Rs 35,769.24

24. 2065 Q.No. 2b

An investor initially pays Rs.60,000 towards the purchase of Rs. 100,000 worth of stock of par value Rs.100 per share. If stock price declines to Rs.60,

- Find the initial margin.
- Find the changed margin.
- If the broker sets a maintenance margin of 20 percent, how far could the stock price fall before the investor would get a margin call? Also interpret the results.

Ans: (i) 60% (ii) 33.33% (iii) Rs. 50

4. MUTUAL FUNDS AND OTHER INVESTMENT COMPANIES

1. 2069 Q.No. 1

Why is mutual fund popular among investors? What are the costs of investing in mutual funds? [5+5]

2. 2068 Old Q.No. 7a

"Mutual funds offer the best form of investment" Discuss. [10]

3. 2066 Q.No. 2

Discuss the current status of mutual funds in Nepal. How well does the mutual fund industry perform relative to a naive buy-and-hold investment strategy? [6+4]

● Write notes on:

4. 2070 Q.No. 8a

Investment company [5]

5. 2069 Old Q.No. 6c

Mutual funds in Nepal [5]

6. 2068 Q.No. 8a

Development of mutual fund in Nepal [5]

7. 2068 Q.No. 8c

Hedge fund versus mutual fund [5]

PART II. PORTFOLIO THEORY & CAPITAL MARKET EQUILIBRIUM

5. RISK AVERSION AND CAPITAL ALLOCATION TO RISKY ASSETS

● Write notes on:

1. 2069 Q.No. 8a
Capital allocation [5]
2. 2068 Old Q.No. 6c / 2067 Q.No. 8a
Capital market line [5]
3. 2063 Q.No. 6 c
Sources of investment uncertainty [5]

NUMERICAL PROBLEMS

4. 2070 Q.No. 4

Consider the following information about a risky portfolio that you manage, and a risk-free asset:

$$E(R_p) = 11\%, \sigma_p = 15\%, R_f = 5\% \quad [4+4+2]$$

- a. Your client wants to invest a proportion of her total investment budget in your risky fund to provide an expected rate of return on her overall or complete portfolio equal to 8%. What proportion should she invest in the risky portfolio, P, and what proportion in the risk-free asset?
- b. What will be the standard deviation of the rate of return on her portfolio?
- c. Another client wants the highest return possible subject to the constraint that you limit his standard deviation to be no more than 12%. Which client is more risk averse?

Ans: (a) 50% (b) 7.5% (c) First

5. 2069 Q.No. 5

Consider a risky portfolio consisting of 25 percent Stock A, 32 percent Stock B, and 43 percent Stock C. Stocks A, B and C have beta 1.3, 2.25 and 0.7 respectively. The expected rate of return of the risky portfolio is 20 percent and standard deviation of 30 percent. The T-bill rate is 10 percent.

- a. If you invest 60 percent of your fund on risky portfolio and 40 percent in T-bill money market fund, what will be the expected value and standard deviation of the rate of return on your portfolio?
- b. What is the beta of your overall portfolio including the T-bill?
- c. What is the reward-to-volatility ratio (S) of your portfolio? [2.5+5+2.5]

Ans: a. 16% & 18% b. 0.8076 c. 0.3333

6. OPTIMAL RISKY PORTFOLIOS

● Write short notes on:

1. 2068 Old Q.No. 6b
Investment decision theory
2. 2067 Q.No. 6b (Old)
Markowitz diversification [5]
3. 2062 Q.No. 6 a
Efficient frontier [5]

NUMERICAL PROBLEMS

4. 2070 Old Q.No. 8b

The expected returns and standard deviations of stock A and B are

| Stock | Expected return | Standard deviation |
|-------|-----------------|--------------------|
| A | 13% | 10% |
| B | 5 | 18 |

Mr. BS Rana buys Rs.20,000 of stock A and sells short Rs.10,000 of stock B, using all of the proceeds to buy more of stock A. The correlation between the two securities is 0.25. What are the expected return and standard deviation of Rana's portfolio? [20]

Ans: (a) $E(r_p) = 17\%$; $\sigma_p = 15.44\%$

5. 2068 Q.No. 5

Consider the following information for two mutual funds.

| | Debt | Equity |
|--------------------------------------|------|--------|
| Expected return, $E(r)$ | 8% | 13% |
| Standard deviation, σ | 12% | 20% |
| Covariance, $Cov(r_D, r_E)$ | 72 | |
| Correlation coefficient, ρ_{DE} | 0.30 | |

- Find out the minimum variance portfolio.
- Calculate the expected return of the minimum variance portfolio.
- Calculate the standard deviation of the minimum variance portfolio.

[4+2+4]

Ans: (a) 0.82 and 0.18 (b) 8.9% (c) 11.45

6. 2068 Old Q.No. 3b

Susan Singh is trying to decide which of the following common stocks to purchase. Based on dominance principle, what would you recommend? [6]

| Name of Issuer | Expected return, (E.R)% | Standard deviation (σ)% |
|----------------|-------------------------|----------------------------------|
| A | 7 | 3.7 |
| B | 7.7 | 4.9 |
| C | 15.0 | 15.05 |
| D | 3.0 | 3.7 |
| E | 7.7 | 12.0 |
| F | 4.0 | 7.0 |

Ans: A or B

7. 2068 Old Q.No. 8b

You are given descriptive statistics for two investments in table below:

| | Debt (D) | Equity (E) |
|-------------------------------------|----------|------------|
| Expected return, $E(r)$ | 8% | 13% |
| Standard deviation, σ | 10% | 15% |
| Covariance, (r_{DE}) | -45 | |
| Correlation coefficient, (r_{DE}) | -0.30 | |

- What proportion is required to be invested in debt and equity so as to hold the portfolio of minimum portfolio standard deviation?
- If the correlation coefficient is 0.9, find the optimal proportion of investment in debt and equity and interpret the result.

[8]

Ans: (i) 0.6506 and 0.3494 (ii) 1.6364 and -0.6364

8. 2067 Q.No. 10

Citizen Investment Trust Nepal (CITN) is considering three mutual funds. The first is a stock fund, the second is long-term government and corporate bond fund, and the third is T-bill money market fund that yields a rate of 8 percent. The expected returns and standard deviations of the risky funds are as follows:

| | Expected return | Standard deviation |
|----------------|-----------------|--------------------|
| Stock fund (S) | 20% | 30% |
| Bond (B) | 12 | 15 |

The covariance between the fund returns is 45.

- What are the investment proportions in the minimum variance portfolio of the two risky funds?
- What is the expected value and standard deviation of its rate of return?
- Calculate the proportion of each asset of the optimal risky portfolio.

- d. What is the expected return and standard deviation of the optimal risky portfolio?
 e. What is the reward-to-volatility ratio of the capital allocation line (CAL) with optimal risky portfolio?

Ans: (a) 0.1739; 0.8261 (b) 13.39%; 13.92% (c) 0.45; 0.55 (d) 15.6%; 16.51% (e) 0.46 [5x4]

9. 2066 Q.No. 8

The returns for Stock X and Stock Y for the last seven years are given below.

| Year | Stock X returns | Stock Y returns |
|------|-----------------|-----------------|
| 2003 | 10% | 15% |
| 2004 | 12 | 12 |
| 2005 | 13 | 15 |
| 2006 | 15 | 18 |
| 2007 | 16 | 20 |
| 2008 | 15 | 20 |
| 2009 | -5 | 5 |

- a. Determine the minimum standard deviation portfolio for Stock X and Stock Y.
 b. Is it true that the portfolio you formed in requirement 'a' is better than investing on Stock X or Stock Y or a portfolio of Stock X and Stock Y formed with proportion other than calculated in 'a'? Support your answer with illustration.
 c. What would be the investors' risk and return if they (i) invested 60 percent of their funds in risk-free asset earning 8 percent and remaining in portfolio formed in 'a' above?
 d. What would be the investors' risk and return if they borrow fund at risk-free rate (8 percent) and double their investment in portfolio constructed in 'a' above. [14+2+2+2]

Ans: a. $\sigma_p = 4.3437\%$; b. true; c. $E(r_p) = 12.0937\%$; $\sigma_p = 1.73748\%$; d. 28.4684% and 8.6874%

10. 2065 Q.No. 9a

Assume that the proportion invested in debenture (W_d) and equity (W_e) are 82% and 18% respectively. The risk and return characteristics of the investment are as follows:

- Expected return on debenture = 8% if $W_d = 1$
 - Standard deviation of return on investment in debenture = 12%
 - Expected return on equity = 13% if $W_e = 1$
 - Standard deviation of return on investment in equity = 20%
 - Correlation coefficient between debenture return and equity return = -1.0
- i. Is this portfolio optimal? If not what is the optimum portfolio return?
 ii. Suppose T-bill rate is 5% and correlation coefficient between bond and equity returns is 0.3. You have the two options: (1) 82% investment in bond and the rest in equity and form a portfolio A, (2) 70% investment in bond and the rest in equity and form a portfolio B. Based on Sharpe's performance measure determine whether portfolio A dominates portfolio B or B dominates A.

Ans: (1) $W_D = 0.625$; $W_E = 0.375$ (2) Portfolio A: $E(r_p) = 8.9\%$; $\sigma_p = 11.4473\%$;
 Portfolio B: $E(r_p) = 9.5\%$; $\sigma_p = 11.6962\%$; $SP_A = 0.3707$; $SP_B = 0.3847$

11. 2062 Q.No. 8 (b)

Assume that proportion invested in debenture (W_D) and equity (W_E) are 80% and 20% respectively. The risk and return characteristics of the investment as follows: [5]

- Expected return on debenture = 8% if $W_D = 1$
- Standard deviation of return on investment in debenture = 12%
- Expected return on equity = 13% if $W_E = 1$
- Standard deviation of return on investment in equity = 20%
- Correlation coefficient between debenture return and equity return = -0.8

- (i) Is this portfolio optimal? If not what is the optimum portfolio return?
 (ii) Suppose T-bill rate is 5% and correlation coefficient between bond and equity return is 0.3. You have the two options: (a) 80% investment in bond and the rest in equity and form a portfolio A. (b) 63.8% investment in bond and the rest in equity and form a portfolio B. Based on Sharp performance measure determine portfolio A dominated portfolio B or B dominates A.

Ans: (i) Not. 9.81% (ii) Portfolio- Return A = 9% and B = 9.81%; Risk: A = 11.45% and B = 12.0125%

12. 2060 Q.No. 4

Consider the returns of the three stocks over 7-year sample period as given below. [10]

| Year | Stock A returns | Stock B returns | Stock C returns |
|------|-----------------|-----------------|-----------------|
| 1 | 10% | 6% | -5% |
| 2 | -5 | 10 | 15 |
| 3 | -7 | 12 | 20 |
| 4 | 15 | 8 | 25 |
| 5 | 20 | 14 | 30 |
| 6 | -30 | 7 | -35 |
| 7 | 12 | 8 | 20 |

- a. Calculate correlation coefficients between returns of the stocks A and B, and A and C.
 b. What is the significance of calculated correlation coefficients in diversifying portfolio risk?

Ans: (a) 0.2432 and 0.781 (b) Correlation coefficient measures the relationship between two assets. The range of correlation varies from +1 (perfectly positive) to -1 (perfectly negative). The correlation +1 represents that the portfolio risk cannot be diversified by forming portfolio from these assets and the correlation -1 represents that portfolio risk can be totally diversified if we form the portfolio from such assets. Thus, correlation helps to know whether we can or cannot minimize the risk and to what extent, while forming the portfolio from such assets.

13. 2059 Q.No. 4

Below are the returns for two assets. [10]

| State of nature | r_1 | r_2 | Probability |
|--------------------|-------|-------|-------------|
| Weak growth | 15% | 15% | 1/3 |
| Strong growth | 30 | 12 | 1/3 |
| Very strong growth | 45 | 9 | 1/3 |
| Expected returns | 30 | 12 | Total 1.0 |

Calculate the two variances and Cov (r_1, r_2). If assets 1 and 2 are combined 50 into a portfolio, what is the variance of this portfolio?

Ans: Variances: 0.0150; 0.0006 and 0.0024

14. 2058 Q.No. 4

Consider the following returns of the three stocks over 7-year sample period. [10]

| Year | Stock A returns | Stock B returns | Stock C returns |
|------|-----------------|-----------------|-----------------|
| 1 | 10% | 6% | -5% |
| 2 | -5 | 10 | 15 |
| 3 | -7 | 12 | 20 |
| 4 | 15 | 8 | 25 |
| 5 | 20 | 14 | 30 |
| 6 | -30 | 7 | -35 |
| 7 | 12 | 8 | 20 |

What is the expected return from a portfolio made up of 20 percent asset A, 40 percent B, and 40 percent C? Assume the expected returns are the annual returns given in year 7. Also interpret the results.

Ans: 13.60%

7. THE CAPITAL ASSETS PRICING MODEL

● Write short notes on:

1. 2069 Old Q.No. 6a

Security market line

[5]

NUMERICAL PROBLEMS

2. 2070 Q.No. 5

Consider the following table, which gives security analysis expected return on two. Stocks for two particular market returns.

[5x 2]

| Market Return | Aggressive stock | Defensive Stock |
|---------------|------------------|-----------------|
| 5% | -2% | 6% |
| 25 | 38 | 12 |

- What are the betas of the two stocks?
- What is the expected rate of return on each stock if the market return is equally likely to be 5% or 25%?
- If the T-bill rate is 6% and the market return is equally likely to be 5% or 25%, draw the SML for this economy.
- Plot the two securities on the SML graph. What are the alphas of each?
- What hurdle rate should be used by the management of the aggressive firm for a project with the risk characteristics of the defensive firm's stock?

Ans: (a) $\beta_A = 2.00$; $\beta_D = 0.30$ (b) $E(r_A) = 18\%$; $E(r_D) = 9\%$ (d) $\alpha_A = -6\%$; $\alpha_D = +0.3\%$; (e) 8.7%,

3. 2068 Q.No. 10a

You are consultant to a large manufacturing corporation that is considering a project with the following net after-tax cash flows (in millions of rupees)

| Year from now | After-tax cash flow |
|---------------|---------------------|
| 0 | -40 |
| 1-10 | 15 |

The project's beta is 1.8. Assuming that risk free rate $r_f = 8$ percent and expected return of the market $E(r_m) = 16$ percent.

- What is the net present value of the project?
- If the project's IRR is 35.73%, what is the highest possible beta estimate for the project before its NPV becomes negative.

[10]

Ans: NPV = Rs. 18.09; $\beta_p = 3.466$

4. 2063 Q.No. 9 (b)

Following are the quarterly information given on stocks:

| Quarterly period | Growth stock return % | S & P stock return % |
|---------------------------------|-----------------------|----------------------|
| 2002 quarter I Q ₁ | 13.92 | 10.02 |
| 2002 quarter I Q ₂ | 19.75 | 11.10 |
| 2002 quarter I Q ₃ | -5.82 | -0.10 |
| 2002 quarter I Q ₄ | -3.16 | 0.40 |
| 2003 quarter II Q ₁ | -10.68 | -2.40 |
| 2003 quarter II Q ₂ | -5.17 | -2.61 |
| 2003 quarter II Q ₃ | 5.45 | 9.68 |
| 2003 quarter II Q ₄ | 0.58 | 1.16 |
| 2004 quarter III Q ₁ | 7.94 | 9.18 |
| 2004 quarter III Q ₂ | 9.48 | 7.34 |
| 2004 quarter III Q ₃ | -6.57 | -4.10 |
| 2004 quarter III Q ₄ | 21.25 | 17.19 |

- Determine standard deviation and variance of return for growth stocks and S & P stocks.
- Find Beta coefficient for growth stocks
- How you make partition of total risk in terms of systematic risk and unsystematic risk for growth stocks.
- Find out coefficient of determination with S & P 500 and in your opinion what coefficient of determining for growth stock helps to measure worth of stock.

[10]

Ans: (i) $\sigma_G^2 = 105.19$, $\sigma_G = 10.26\%$; $\sigma_{m^2} = 42.70$; $\sigma_m = 6.53\%$ (ii) 1.488 (iii) systematic risk = 94.55; Unsystematic risk = 10.64 (iv) Coefficient of determination = 0.90

5. 2061 Q.No. 8

Consider the follow return data of CIT Growth Fund

[20]

| Year | CIT Return | NEPSE Return |
|------|------------|--------------|
| 1995 | 5.45% | 9.68% |
| 1996 | 0.58 | 1.76 |
| 1997 | 7.94 | 9.18 |
| 1998 | 9.48 | 7.34 |
| 1999 | -6.57 | -4.10 |
| 2000 | 21.25 | 17.19 |

- Determine the variance of return for the CIT Growth Fund and the NEPSE.
- Calculate the beta coefficient for CIT Growth Fund.
- Compute systematic and unsystematic risk components.
- What conclusions do you draw about the riskness of CIT Growth Fund?
- Calculate CIT Growth Fund's coefficient of determination with the NEPSE. What does it mean?

Ans: (a) 72.5607 and 44.4006 (b) 1.23 (c) 67.1737 (e) 92.53%

6. 2060 Q.No. 5

Suppose the current expected return on the market is 16 percent and the risk free rate is 10 percent. The expected return and betas for three stocks are listed below. Which is overpriced? Which is underpriced? Draw a graph and show how you reached your conclusion about which asset is over- or underpriced. [10]

| Stocks | Expected return | Beta |
|----------------|-----------------|------|
| Franklin Corp. | 16% | 1.20 |
| AZZ Corp. | 19 | 1.30 |
| BBB Corp. | 13 | 0.75 |

Ans: (a) Overpriced; Underpriced; Overpriced

7. 2060 Q.No. 8 (d)

A diversified portfolio is composed of the following five stocks. (a) What is the portfolio's beta? (b) What does the CAPM suggest the expected return for this portfolio should be? [5]

| Stock | Price | Number held | Estimated beta |
|-------|-------|-------------|----------------|
| Z | Rs.20 | 1000 | 0.80 |
| AB | 30 | 2000 | 0.90 |
| QZ | 15 | 4000 | 1.25 |
| DB | 10 | 1000 | 1.05 |
| RST | 8 | 5000 | 1.15 |

Assume that the expected market return is 16 percent and the expected risk-free rate is 9 percent.

Ans: (i) Total beta = 1.061 (ii) 16.427%

8. 2059 Q.No. 5

Compute the beta coefficient for stocks A and B with the information given below. (a) Which stock has the most total risk? (b) The most undiversifiable risk? [10]

| Stock | Correlation coefficient with market | Standard deviation, σ |
|-------|-------------------------------------|------------------------------|
| A | 0.40 | 0.5 |
| B | 0.75 | 0.6 |

The variance of market returns is 0.20.

Ans: (a) A the assets with higher standard deviation is considered more risk, the stock B ($\sigma = 0.6$) is greater than stock A ($\sigma = 0.5$). So, the stock B has most total risk. (b) $\beta_A = 0.4472$ and $\beta_B = 1.0662$. Comparing the beta coefficient of two assets, stock B is larger than stock A. So, the stock B has the most diversifiable.

9. 2059 Q.No. 8 (d)

Assume that the return on the market is 14 percent and the risk-free rate is 8 percent. Use the CAPM to determine whether of the following stocks are overpriced or underpriced. [5]

| Stock | Expected return, % | Beta |
|-------|--------------------|------|
| A | 17 | 1.2 |
| B | 14 | 0.8 |
| C | 15 | 1.5 |
| D | 16 | 0.75 |

Ans: (i) $r_f + [E(r_m) - r_f] \beta_i$ (ii) A: Underpriced (15.2%); B: Underpriced (12.8%); C: 17.0% (Overpriced); D: Underpriced (12.5%)

10. 2058 Q.No. 5

Suppose the current expected return on the market is 16 percent and the risk-free rate is 10 percent. The expected return and betas for three stocks are listed below.

| Stocks | Expected return | Beta |
|----------------|-----------------|------|
| Franklin Corp. | 16% | 1.20 |
| AZZ Corp. | 19 | 1.30 |
| BBB Corp. | 13 | 0.75 |

- a. If the expected return from the market and the risk free rate rose to 18 and 14 respectively, which stocks would be underpriced? Overpriced?
- b. What conclusions can you draw about the implication of the CAPM model from your solution to this problem? [10]

Ans: (a) Overpriced; Underpriced; Overpriced

11. 2058 Q.No. 8 (d)

A diversified portfolio is composed of the following four stocks.

- a. What is the portfolio's beta?
- b. What does the CAPM suggest the expected return for this portfolio should be? [5]

| Stock | Price | Number held | Estimated beta |
|-------|-------|-------------|----------------|
| Z | Rs.20 | 1,000 | 0.80 |
| AB | 30 | 2,000 | 0.90 |
| QZ | 15 | 4,000 | 1.25 |
| DB | 10 | 1,000 | 1.05 |

Assume that the expected market return is 16 percent and the expected risk-free rate is 9 percent.

Ans: (a) Total beta = 1.061 (b) 20.666%

8. SINGLE INDEX MODEL

● Write notes on:

1. 2060 Q.No. 6 a

Characteristic line [5]

NUMERICAL PROBLEMS

2. 2067 Q.No. 6

The data below describe a four-stock financial market that satisfies the single-index model.

| Stock | Capitalization | Beta | Market excess return | Standard deviation |
|-------|----------------|------|----------------------|--------------------|
| A | Rs. 3,000 | 1.0 | 10% | 40% |
| B | 1,940 | 0.2 | 2 | 30 |
| C | 1,360 | 1.7 | 17 | 50 |
| D | 2,000 | 1.5 | 15 | 25 |

The standard deviation of the market portfolio is 25 percent?

- a. What is the mean excess return of the index portfolio?
- b. What is the covariance between stock A and stock B?
- c. What is the covariance between stock B and the index?
- d. Break down the variance of stock B into systematic and firm-specific components.
- e. Interpret the systematic risk of stock B. [5x2]

Ans: (a) 10.482% (b) 125 (c) 125 (d) 25 and 875

3. 2062 Q.No. 4 (b)

From the following information relating to security A and B, calculate (i) the factor risk of the portfolio if standard deviation of the factor is 15%. (ii) non-factor risk of the portfolio, (iii) portfolio standard deviation. [5]

| Security | Factor sensitivity | Non-factor risk | Proportion |
|----------|--------------------|-----------------|------------|
| A | 0.2 | 49 | 0.4 |
| B | 3.5 | 100 | 0.6 |

Ans: (i) 993.69 (ii) 43.84 (iii) 32.21