9. ARBITRAGE PRICING THEORY AND EFFICIENT MARKET HYPOTHESIS

THEORETICAL QUESTIONS

1. 2065 Q.No. 4a

You are a technical stock market analyst in your firm. Your boss has asked you to recommend a set of indicators you think are suitable in Nepal. Justify your answer.

2. 2062 Q.No. 2 (a)

You are a top technical analyst in your firm, and your boss has asked you for an answer to a difficult question. He wants to know which indicators you think is the best in Nepal and why you think so. What is your answer? [5]

3. 2062 Q.No. 7 (a)

Why fundamental analysts consider past information important and relevant in determining value of stock? [10]

● **Write short notes on:**

4. 2070 Q.No. 8b

Efficiency market hypothesis [5]

5. 2068 Old Q.No. 6a / 2065 Q.No. 6c

Efficient market hypothesis

6. 2067 Q.No. 8b

Arbitrage opportunities [5]

7. 2061 Q.No. 6 a

Technical analysis [5]

8. 2059 Q.No. 6 b

Arbitrage pricing theory [5]

NUMERICAL PROBLEMS

9. 2070 Old Q.No. 8

Assume that security returns are generated by a factor model in which two factors are pervasive. The sensitivities of two securities and of the risk free asset to each of the two factors is shown below, along with expected return on each security.

Security	b_{i1}	b_{i2}	Expected return
A	0.50	0.80	16.2%
B	1.50	1.40	21.6
r_f	0.00	0.00	10.0

(i) If Dots Miller, an investor has Rs.100 to invest and sells short at Rs.50 of security B and purchases Rs.150 of security A, what is the sensitivity of Dot's portfolio to the two factors?

(ii) IF Dots now borrows Rs.100 at the risk free rate and invests the proceeds of the loan along with the original Rs.100 in securities A and B in the same proportions as described in part (i). What is the sensitivity of this portfolio to the two factors?

(iii) What is the expected return on the portfolio created in part (ii)?

Ans: (i) $\beta_{P1} = 0$; $\beta_{P2} = 0.5$ (ii) $\beta_{P1} = 0$; $\beta_{P2} = 1$; (c) $E(R_P) = 17\%$

10. 2069 Q.No. 6

Suppose that the market index is well-diversified portfolio with expected return of 10 percent and that deviation of its return from expectation can serve as the systematic factor. The T-bill rate is 4 percent.

a. What should be the return on a well-diversified portfolio, say E, with a beta of 2/3?

b. If the expected return on portfolio 'E' is 9 percent, does an arbitrage opportunity exist? If so what should be the strategy to exploit arbitrage opportunity?

c. Assume that there is portfolio G which is well diversified with a beta of 1/3 and expected return of 5 percent. Does an arbitrage opportunity exist? If so what should be the strategy to exploit arbitrage opportunity? [2+4+4]

Ans: a. 8% c. 6%

11. 2069 Old Q.No. 8a

Seybold owns a portfolio with the following characteristics. (Assume that returns are generated by a one-factor model)

Security	Factor sensitivity	Proportion	Expected return
A	2.0	0.20	20%
B	3.5	0.40	10
C	0.5	0.40	5

Seybold decides to create an arbitrage portfolio by increasing the holdings of security A by 0.20.

j. What must be the weights of the other two securities in Stock's arbitrage portfolio?
ii. What is the expected return on the arbitrage portfolio?
iii. If everyone follows Seybold buy-and-sell-decisions, what will be the effects on the prices of the three securities? [10]

Ans: (i) $W_B = -0.10$; $W_C = -0.10$ (ii) 12.50%

12. 2068 Q.No. 10b

Suppose that there are two independent economic factors, F1 and F2. The risk-free rate is 6 percent, and all stocks have independent firm-specific components with standard deviation of 45 percent. The following are well-diversified portfolios:

Portfolios	Beta on F1	Beta on F2	Expected return
A	1.5	2.0	31%
B	2.2	−0.2	27%

What is the expected return beta relationship in the economy? [10]

Ans: $E(R_P) = R_F + 10\beta_{P1} + 5\beta_{P2}$

13. 2067 Q.No. 4 (Old)

The cash dividends per share of the ABC Company have been growing at an annual rate of 5 percent, and this growth rate is expected to continue unabated into the foreseeable future. ABC's current cash dividend is Rs. 20 per share. The following two-factor model is assumed to be appropriate to determine the required rate of return on the shares of ABC:

$E(r_{ABC}) = 5\% + b_{i1}(2\%) + b_{i2}(4\%)$

The factor betas for ABC stock are:

$b_{i1} = 1.5$ and $b_{i2} = 0.75$

a. Use the above information and the dividend discount model to value a share of ABC's stock.
b. Point out the limitations of dividend discount model. [8+2]

Ans: (a) Rs. 350 per share

14. 2067 Q.No. 8 (Old)

Suppose the following two-factor model describes security returns:

$E(r_i) = \lambda_0 + \lambda_1 b_{i1} + \lambda_2 b_{i2}$

The following three portfolios are observed:

Portfolio	E(r)	b_{i1}	b_{i2}
Q	17%	1	0.8
R	15%	0.7	1
S	12%	0.6	0.5

a. Determine the two-factor equilibrium equation for the three portfolios. Explain the equation you have determined.
b. Suppose the stock of T Corporation was found in disequilibrium. [16]

Stock	E(r)	b_{i1}	b_{i2}
T Corp.	12%	0.8	0.7

Can you earn risk-less profit? Support your answer with calculations.

Ans: (a) 4.2942% + 9.4117% b_{i1} + 4.1176% x b_{i2} (b) Rs 27.10

15. 2066 Q.No. 9

Suppose the following two-factor model describes security returns:

$E(r_i) = \lambda_0 + \lambda_1 b_{i1} + \lambda_2 b_{i2}$

The following three portfolios are observed:

Portfolio	E (r)	b_{i1}	b_{i2}
Q	17%	1	0.8
R	15%	0.7	1
S	12%	0.6	0.5

a. Determine the two-factor equilibrium equation for the three portfolios.
b. Suppose the stock of T Corporation was found in disequilibrium.

Stock	E (r)	b_{i1}	b_{i2}
T Corp.	16%	0.8	0.7

Can an investor earn riskless profit? Illustrate.
c. Does APT suggest us how many factors we should have in the model and what they might be?

[8+8+4]

Ans: a. E (r_i) = 4.2942% + 9.4117% b_{i1} + 4.1176% x b_{i2}; b. Rs 12.9 per Rs 1,000

16. 2065 Q.No. 8b

Assume that the one factor APT model applies..
The characteristics regarding expected return and sensitivity of the current equilibrium portfolio are given:

Equilibrium portfolio	A	B
Expected return (%)	15	10
Factor sensitivity (bp)	1.5	0.5

i. Determine the arbitrage pricing line that is consistent with the equilibrium priced portfolio.
ii. Assume portfolio C exists with expected return of 15% and coefficient of sensitivity is 1.2, what arbitrage opportunities are present?

Ans: (i) E(r_i) = 7.5 + 5 x b_{i1}; (ii) arbitrage profit = Rs. 15 (assuming initial investment = Rs. 1,000)

17. 2064 Q.No. 9

a. Consider the following data for two-factor model assuming that all portfolio are well diversified. The factor model for stock X and stock Y is estimated with following results.

Portfolio	E (R)	Bi1	Bi2
X	10%	1.2	0.8
Y	12	2.0	0.5
Z	13	2.1	1.2

i. Determine equilibrium equation to find value of lamda1 and lamda2 and lamda3.
ii. How it helps in creating arbitrage opportunities?   Note: lamda1 = λ_0; lamda2 = λ_1; lamda3 = λ_2

b. Assume single factor model and consider three well diversified portfolios with zero non-factor risk.

Securities	Factor sensitivity	Expected return
A	0.80	10.4%
B	1.00	10.0
C	1.20	15.6

i. Calculate required rate of return using one factor model.
ii. Which security is not in line with single factor model relationship?
iii. Which portfolio combination is appropriate to provide same factor sensitivity as that of portfolio B?   Assume: Riskfree rate = 4% and The expected value of the factor is 8%.

Ans: (a) (i) λ_0= 5.7461%; λ_1= 2.867%; λ_2= 1.0169% (b) (i) r_A = 10.4%; r_B = 12%; r_C = 13.6%(ii) B and C

8. 2062 Q.No. 9 (b)

Assume that the one factor APT model applies. The characteristics regarding expected return and sensitivity of the current equilibrium portfolio are given: [10]

Equilibrium Portfolio	A	B
Expected return (%)	16	10
Factor sensitivity (bp)	18	0.6

Determine the arbitrage pricing line that is consistent with the following equilibrium priced portfolio. Assume portfolio C exists with expected return of 16% and coefficient of sensitivity is 1.2, what arbitrage opportunities are present?

Arbitrage opportunity is created. B dominated A.

PART III. FIXED INCOME SECURITIES ANALYSIS

10. BOND PRICES AND YIELDS

1. 2070 Q.No. 9
What are the merits and demerits of debt securities? Discuss the major types of fixed income securities which are popular in Nepal.   [10+10]

2. 2068 Q.No. 9
What are important investment alternatives? Describe the types of bonds available in Nepal. Also discuss the problems of bond market in Nepal.   *(Chapter 1 and 10)* [20]

3. 2068 Old Q.No. 5b
What are the major types of fixed income securities currently popular in Nepal? Explain any two most popular securities.   [4]

● **Write short notes on:**

4. 2070 Old Q.No. 6b
Municipal bonds   [5]

5. 2065 Q.No. 6b
Euro dollars and Euro bonds

6. 2066 Q.No. 6b
Eurobond

NUMERICAL PROBLEMS

7. 2070 Q.No. 10

a. The yield to maturity on two 10-year maturity bonds currently is 7%. Each bond has a call price of Rs. 1,100. One bond has a coupon rate of 6%, the other 8%. Assume for simplicity that bonds are called as soon as the present value of their remaining payments exceeds their call price. What will be the capital gain on each bond if the market interest rate suddenly falls to 6%?

b. A 20-year maturity 9% coupon bond paying coupons semi-annually is callable in five years at a call price of Rs. 1,050. The bond currently sells at a yield to maturity of 8%. What is the yield to call?

c. Find the duration of a 6% coupon bond making annual coupon payments if it has three years until maturity and has a yield to maturity of 6%. What is the duration if the yield to maturity is 10%?

d. What is the relationship between duration and changes in the price of bonds?   [6+6+6+2]

Ans: (a) First bond; Rs. 70.28; 7.56%; Second bond: Rs. 29.81, 2.785% (b) 7.458%(c) 2.8334 years and 2.8237 years

1. 2069 Q.No. 10a
The yield to maturity on two 10-year maturity bonds currently is 7 percent. Each bond has a call price of Rs. 1,100. One bond has a coupon rate of 6 percent, the other 8 percent. Assume for simplicity that bonds are called as soon as the present value of their payments exceeds their call price. What will be the capital gain on each bond if the market interest rate suddenly falls to 6 percent?   [6]

Ans: 7.56% & 2.785%

2. 2069 Q.No. 10b
A convertible bond has the following features:

Coupon	5.25%
Maturity	June 15, 2027
Market price of bond	Rs. 77.50*

Annual dividend	Rs. 1.20
Conversion ratio	20.83 shares

*The given figure is corrected as Rs. 775.

Calculate the conversion premium for this bond. [8]

Ans: Rs. 191.76

3. 2067 Q.No. 11a

Bond of Z corporation with a par value of Rs. 1,000 sell for Rs. 960, mature in 5 years, and have a 7 percent annual coupon rate paid semiannually. Calculate:

i. Current yield.

ii. Yield to maturity.

iii. Realized compound yield for an investor with a 3-year holding period and a reinvestment rate of 6 percent over the period. At the end of 3 years the 7 percent coupon bonds with 2 years remaining will sell to yield 7 percent.

iv. List one major shortcoming for each of the above yield measures. [8]

Ans: (i) 7.29% (ii) 7.9876% (iii) 8.34%

4. 2065 Q.No. 5b

Consider two pure discount bonds issued by Nepal Rastra Bank with maturities of 90 days and 180 days, and prices of Rs.960.23 and Rs.953.79 respectively. Each bond has a Rs. 1,000 face value Based on this information, what are the annualized spot rates for ❶ 90-days and ❷ 180-days?

Ans: (1) 17.88% (2) 10.06%

5. 2064 Q.No. 4

a. Samsung Company issues 8% coupon bond with Rs. 1000 showing 20 years maturity. There is semi-annual interest payment and required rate of return on bond is 10 percent. In such a case, what is the value of bond?

b. Suppose the market price of one-year maturity 8% coupon bonds with face value of Rs. 1000 is Rs. 900. Assuming semi-annual interest payments, what is the coupon yield and current yield of bond?

Ans: (a) V_d = Rs. 828.364 (b) Coupon yield = 8% and Current yield = 8.89%

6. 2059 Q.No. 8 (b)

A Treasury bond that has a Rs.1,000 face value and pays a 12.0 percent coupon semi-annually currently is selling for Rs.856. (a) If the bond issue has 14 years until maturity, what is its YTM? (b) What is this bond's YTM if it is selling for Rs.1,150? [5]

Ans: (a) 14.98%; (b) 10.24%

7. 2058 Q.No. 8 (b)

Gerald Jones purchased a 10 percent coupon semi-annual bond of the F. Corporation at par value, which had 10 years to maturity. Immediately after Jones purchased the bond, interest rates on bonds of this risk level rose to 12 percent and remained there until the bond was sold at the end of the fifth year. If the yield curve remained flat during the 5-year period that Jones owned the bond and he reinvested all of his coupon interest, what rate of return did he earn on his 5-year investment? Ignore taxes and commissions. [5]

Ans: FV of coupons = Rs. 659.04 and total future value at the end of 5 years = Rs. 1,585.45

11. THE TERM STRUCTURE OF INTEREST RATES

THEORETICAL QUESTIONS

1. 2068 Old Q.No. 4a

Why does the yield curve usually have upward slope and sometimes downward slope? Give reasons. [4]

2. 2067 Q.No. 7 (Old)

Define yield curve and describe main theories explaining the shape of yield curve. [16]

3. 2066 Q.No. 1

Explain expectation theory of the term structure of interest rates. Is it true that an observed downward-sloping yield curve is inconsistent with the liquidity preference theory of the term structure of interest rates? Explain. [5+5]

NUMERICAL PROBLEMS

4. 2069 Old Q.No. 9a

Use the following data:

Bond	Maturity years	YTM
A	1	8.0%
B	2	9.0
C	3	10.5
D	4	12.0

i.   Calculate the implied rate for a 3-year bond starting in year 2.
ii.   Calculate the implied 1-year forward rate starting in year 3.   **[10]**

                 Ans: (i) 13.36% (ii) 13.56%

5. 2068 Old Q.No. 4b

You are given the pattern of short-term interest rates for the next four years in the table below:**[4]**
Short-term interest rates based on one-year Bonds in coming years:

Year	Interest rate (%)
O (Today)	8
1	10
2	11
3	11

i.   Calculate the bond price in year 1, 2, 3 and 4, if the present value of the bond in future is Rs 1,000 cash flow.
ii.   Calculate the yield to maturity in year 3.

       Ans: (i) Rs 925.9259; Rs 841.7508; Rs 758.32; Rs 683.20 (ii) 9.66%

6. 2067 Q.No. 11b

The yield to maturity on 1-year zero coupon bonds is currently 7 percent; the YTM on 2-year zeros is 8 percent. The Treasury plans to issue a 2-year maturity coupon bond, paying coupons once per year with a coupon rate of 9 percent. The face value of the bond is Rs. 1,000.
i.   At what price will the bond sell?
ii.   What will the yield to maturity on the bond be?
iii.   If the expectations theory of the yield curve is correct, what is the market expectation of the price that the bond will sell for next year?
iv.   Recalculate your answer to (iii) if you believe in the liquidity preference theory and you believe that the liquidity premium is 1 percent.   **[10+10]**

   Ans: (i) Rs 1018.6114 (ii) 7.96% (iii) 9.01%; Rs 999.91 (iv) 8.01%; Rs 1,009.1658

7. 2065 Q.No. 8a

Assume that the current one year spot rate is 5% and the forward rates for one year hence and two year hence are respectively:
$f_{1,2} = 8\%$; $f_{2,3} = 9\%$
What would be the market price of a 6% coupon bond with a Rs.10,000 face value, maturing three years from today? The first interest payment is due one year from today and the interest is payable annually

          Ans: Rs. 9,655.40

8. 2062 Q.No. 5 (a)

Consider two T-bonds of different maturity. 10-year T-bond yield 12% and 5-year T-bond yield 8% on an average over the period. What is the expected return on 5-year bond starting at the end of year 5?   **[5]**

          Ans: 16.15%

9. 2060 Q.No. 8 (a)

Assume the following zero coupon bonds with face value of Rs.1,000 are available: **[5]**

Bond price	Maturity, years
Rs.935	1
870	2
800	3
750	4

(i) Determine the yield to maturity for each bond.

(ii) Determine the 1-year forward rate at the beginning of the year 3.

Ans: (i) 6.95%; 7.21%; 7.72% and 7.46% (ii) 8.74%

10. 2059 Q.No. 8 (a)

Assume the following zero coupon bonds with face values of Rs.1,000 are available: [5]

Bond price, Rs.	Maturity, years
Rs. 935	1
870	2
800	3
750	4

Describe how an investor could lock-in the 1-year forward rate for year 3.

Ans: 8.74%

11. 2058 Q.No. 8 (a)

Assume the following zero coupon bonds with face value of Rs.1,000 are available: [5]

Maturity, years	1	2	3	4
Bond price	Rs.935	870	800	750

Determine the yield to maturity for a 3-year bond beginning in year 1?

Ans: 8.74%

12. FIXED INCOME PORTFOLIO MANAGEMENT

THEORETICAL QUESTIONS

1. 2063 Q.No. 5 (a)

How duration measures the interest rate sensitivity? Explain. [5]

NUMERICAL PROBLEMS

2. 2069 Q.No. 10c

A newly issued bond has 8 percent coupon rate and 8 percent yield to maturity. Its maturity is 15 years and the Macaulay's duration is 10 years.

i. Calculate modified duration using the above information.

ii. Identify the direction of change in modified duration if the coupon of the bond were 4 percent, not 8 percent. [6]

Ans: (i) 9.2593 years (ii) 9.8370 years

3. 2068 Q.No. 7

Consider Hydropower Bond- it is a Rs. 1,000 par value bond with annual coupon payment of Rs. 80 and remaining life of three years. The current market price of the bond is Rs. 950.25 and the YTM is 10 percent. Consider Solarpower Bond–that matures in one year, provide a single payment of Rs. 1,070 (Rs. 70 coupon and Rs. 1,000 par value). Because the bond is selling currently for Rs. 972.73 its YTM is also 10 percent. [3+4+3]

a. Calculate the durations of both bonds.

b. Suppose a portfolio manager has an obligation to pay Rs. 1,000,000 in two years. How much the manager would need to invest now in the bonds so that he has cash to pay in two years?

c. How much should s/he invest in Hydropower Bond and how much in Solarpower Bond to create fully immunized portfolio?

Ans: (a) 2.78 and 1 year (b) Rs 826,446.2809 (c) 56.18% and 43.82%

4. 2068 Old Q.No. 8a

Portfolio manager of Friendship Finance Company is planning to make a cash outflow of Rs 10,000,000 for the construction of its own building at New Baneshwor in two years. For this purpose he has decided to make the available cash now to invest in portfolio of two different bond issues. The first 8% bond 'A' has a maturity of 3 years with coupon rate of 8%, semi-annual interest payment, while second 6% bond 'B' that matures in 1 year. Both bonds are issued with a face value of Rs 10,000. The yield to maturity of bonds is 10 percent. How much investment should be made in each of the bonds to fully immunize the interest rate risk? [12]

Ans: 58.24% in bond 1 and the 41.76% in bond 2

5. 2067 Q.No. 5 (Old)

Consider Suryajyoti bond – it is a Rs. 1,000 par value bond with annual coupon payment of Rs. 80 and remaining life of three years. The current market price of the bond is Rs. 950.25 and the YTM is 10 percent. Consider Deepjyoti bond – that matures in one year and provides a single payment of Rs. 1,070 (Rs. 70 coupon and Rs. 1,000 par value). Because the bond is selling currently for Rs. 972.73, its YTM is also 10 percent.

a. Calculate the durations of both bonds.

b. Suppose a portfolio manager has an obligation to pay Rs. 1,000,000 in two years. How much the manager would need to invest now in the bonds so that he has cash to pay in two years?

c. How much should she/he invest in Suryajyoti and how much in Deepjyoti to create fully immunized portfolio?   [10]

Ans: (a) 2.78 years and 1 year (b) Rs 826,446.2809 (c) 56.18% & 43.82%

6. 2065 Q.No. 9b

Assume that a portfolio manager needs to make only one cash outflow of Rs. 1,000,000 from a portfolio investment in two years. For this purpose, he has decided to make investment now in two different bond issues. The first bond has a maturity of 3 years with coupon rate of 8% while second bond that matures in 1 year with coupon rate of 7 percent. Both bonds are issued with a face value of Rs. 1,000. The yield to maturity of bonds is 10 percent. How much investment should be made in each of the bonds to fully immunize the interest rate risk?

Ans: $W_1 = 0.5625$ and $W_2 = 0.4374$

7. 2065 Q.No. 5a

Calculate the duration of the following two bonds assuming coupons are paid semi-annually.

Bond	Coupon rate	Years until maturity	Yield to maturity	Duration of bond
A	10.0%	2.0	10.0%	?
B	0.00	3.0	10.0	?

Explain why the two bonds above have different durations using intuitive verbal economics rather than pure mathematics.

Ans: D_A = 1.86 years and D_B = 3 years

8. 2063 Q.No. 5 (b)   [5]

Information on two bonds are given below:

	Bond A	Bond B
Face value	Rs. 1,000	Rs. 1,000
Maturity	10 years	10 years
Coupon interest	4%	8%

Find out Macaulay's duration for bond A and bond B.

Ans: B and A = 8.43 years, Bond B = 7.25 years

9. 2062 Q.No. 9 (a)

Assume that a portfolio manager needs to make only a cash outflow of Rs. 100,00,000 from a portfolio in two years. For this purpose, he has decided to make investment now in two different bonds issues. The first bond has a maturity of 5 years with coupon rate of 12 percent while second bond that matures in 1 year with coupon rate of 7 percent. Both bonds are issued with a face value of Rs. 1,000. The yield to maturity of bonds is 10 percent. How much investment should be made in two types of bond stated above?   [10]

Ans: 33% on bond 1 and 67% on bond 2

10. 2061 Q.No. 4

Assume that a Treasury bond is issued for 10 years at 5 percent coupon rate payable annually.

a. What will be the price of the bond four year after issue date is the market rate of interest is 4.0 percent?

b. What will be bond's Macaulay's duration four years after it is issued?   [10]

Ans: (a) Rs. 1,052.405 (b) 7.1489 years

11. 2060 Q.No. 8 (b)

Calculate the YTM and Macaulay's duration for the two Treasury bonds below.　　[5]

Year	Bond 1 cash flows	Bond 2 cash flows	
0	− Rs.1,000	− Rs.1,000	Purchase price
1	100	0	
2	100	0	
3	100	0	
4	100	0	
5	100	0	
6	1,100	1,700	Selling price

Ans: YTM = 9.25% and MD = 3 years

PART IV. SECURITY ANALYSIS

13. MACROECONOMICS AND INDUSTRY ANALYSIS

1. 2070 Q.No. 2

Explain the fundamental analysis and technical analysis. Which method do you prefer?　　[10]

2. 2069 Old Q.No. 3a

What is a fundamental analyst? How does a fundamental analyst differ from a technical analyst?　　[5]

3. 2067 Q.No. 9

Why is it important to make economic and industry analysis for investing? Discuss key economic variables to analyze Nepalese economy.　　[10+10]

● **Write short notes on:**

4. 2069 Q.No. 8b

Market efficiency　　[5]

5. 2068 Q.No. 8b

Industry analysis

14. EQUITY VALUATION MODEL

THEORETICAL QUESTIONS

1. 2069 Old Q.No. 4a

Should the value of a security remain stable in equilibrium? What might change the value of a security? How often might such changes occur?　　[5]

● **Write notes on:**

2. 2066 Q.No. 6 a

Price-Earning model of valuation

NUMERICAL PROBLEMS

3. 2070 Q.No. 6

ABC stock has an expected ROE of 12% per year, expected earnings per share of Rs. 2 and expected dividends of Rs. 1.50 per share. Its market capitalization rate is 10% per year.　　[5+5]
a. What are its expected growth rate, its price, and its P/E ratio?
b. If the plowback rate were 0.4, what would be the expected dividend per share, the growth rate, price, and the P/E ratio?

Ans: (a) g = 3%; P_0 = Rs 21.43; R/E = 10.71 (b) D_1 = Rs.1.20; g = 4.8%; P_0 = Rs 23.08; R/E = 11.54

4. 2070 Old Q.No. 5

Electronic, IUC has a current DPS of Rs.2 and required rate of return is 14 percent. Expected annual growth rate of dividend is given below:

Year	Dividend growth rate
1 - 3 years	25%
4 - 6 years	20%
7 - 9 years	15%
10 years on	9%

Required:

(a) Value of dividend stream for year 10 and all future dividends using a detail spreadsheet. [10]

(b) Find value of stock.

Ans: (a) D_1 = Rs.2.5; D_2= Rs.3.125; D_3= Rs.3.90625; D_4= Rs.4.6875; D_5= Rs.5.625; D_6 = Rs.6.75; D_7 = Rs.7.7625; D_8 = Rs.8.9269; D_9 = Rs.10.2659; D_{10} = Rs.11.1898; (b) P_0 = Rs. 94.3243

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5. 2069 Old Q.No. 3b

① Mrs. Sunita is considering purchasing the common stock of the Investment Bank. Bank's current market price is Rs. 750 per share. According to Hari's analysis, Investment Bank has a present value of Rs. 800 per share. What should Sunita do? Explain.

② Mr. Nab Raj is seriously thinking about investing in the common stock of the Everest Bank. Bank has a current market price of Rs. 350 per share. Rajendra has estimated that Everest Bank should be selling for Rs. 300 per share. Should Nab Raj purchase the stock? Explain. [5]

Ans: (i) Purchase (ii) Do not purchase

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6. 2069 Q.No. 11

You have been working in an investment advisory company. One of your friends approached you for your advice on the following:

a. One of the stocks your friend has considered is that of Himalayan Aqua Ltd. The company has just paid its annual dividend of Rs. 3 per share. The dividend is expected to grow at a constant rate of 8 percent indefinitely. The beta of Himalayan Aqua stock is 1, the risk-free rate is 6 percent, and the market risk premium is 8 percent. Given the information your friend needs advice on:

   i. Should your friend buy the stock if it is trading at Rs. 50?

   ii. What would be your revised estimate of the value of the stock if you believed that the stock was riskier, with a beta of 1.25?

b. Another stock your friend is interested is that of Generic Genetic (GG) Company. GG pays no cash dividends currently and is not expected to for the next 4 years. Its last EPS was Rs. 5, all of which was reinvested in the company. The firm's expected ROE for the next 4 years is 20 percent per year, during which time it is expected to continue to reinvest all of its earnings. Starting 5 years from now, the firm's ROE on new investments is expected to fall to 15 percent per year. What is the maximum price your friend should pay for GG company stock?

c. The third company your friend has selected is The Cooper Company. It had paid dividend of Rs. 18 per share over the past year with a forecast that dividends would grow by 5 percent per year forever. Further assume that the required rate of return on Copper stock is 11 percent, the current stock price is Rs. 400 per share and that the earning per share (E_0) was Rs. 27.

   i. What is the actual price-earnings ratio?

   ii. What is the normal price-earnings ratio?

   iii. Is the stock of Cooper Company over priced or under priced? [6+8+6]

Ans: a.(i) Rs. 54 per share (ii) Rs. 40.50 per share b. Rs. 47.42 per share c.(i) 11.11 times (ii) 14.11 times

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7. 2068 Q.No. 6

The M Corporation's cash flow from operations before interest and taxes was Rs. 2 million in the year just ended, and it expects that this will grow by 5 percent per year forever. To make this happen, the firm will have to invest an amount equal to 20 percent of pretax cash flow each year. The tax rate is 35 percent. Depreciation was Rs. 200,000 in the year just ended and is expected to grow at the same rate as the operating cash flow. The appropriate market capitalization rate for the unleveraged cash flow is 12 percent per year, and the firm currently has debt of Rs. 4 million outstanding. Use the free-cash flow approach to value the firm's equity. [10]

Ans: Value of debt Rs. 4 million and Value of equity Rs. 10,550,000

8. 2068 Old Q.No. 5a

Assume that Info Tech Company has a 5 percent annual expected constant growth rate of earnings if there is no inflation.

Expected EPS = Rs 2 per share;

Expected ROE = 10 percent per year;

Retention ratio = 0.4 and

Capitalization rate = 10 percent per year. [6]

i. What is the current price of a share?

ii. What are the expected dividend yield and the rate of capital appreciation?

iii. If the firm's real revenues and dividends are unaffected by inflation, and expected inflation is 6% per year, what should be the nominal growth rate in dividends, and the expected nominal dividend yield, the expected ROE, and the nominal plowback ratio?

Ans: (I) Rs. 24 (ii) 5% (iii) 11.3%; 5.3%; 16.6%; 0.6807

9. 2065 Q.No. 3b

Assume that the stock price of Holding Inc is currently selling at Rs.12.60 with EPS of Rs.2 70.

i. Calculate simple price earning multiple.

ii. The local stock broker indicates that Holding Inc., has undervalued stock and he is optimistic that stock price will have 5 percent increase in P/E ratio and EPS increase by 20 percent Calculate change in P/E ratio and value of stock.

iii. If you think that' required rate of return of 18 percent is appropriate, should you follow suggestion of a broker? Explain.

Ans: (i) 4.6667 times (ii) 5% and Rs. 15.876 (iii) 26%

10. 2063 Q.No. 4

Electronics, SNC retains 70 percent of earnings to finance rapid sales growth. The analysis of the company indicates 14% average rate of return on incremental equity capital. But required rate of return on common stock is 16 percent.

a. Calculate growth rate in earnings and value of common stock if company earns Rs. 3.86 per share

b. How the growth rate and value of common stocks change if company retains 40% of retained earnings. [10]

Ans: (a) 9.8% and Rs. 1868 (b) 5.6% and Rs. 22.27

11. 2062 Q.No. 3 (b)

Nepal Tennis Racket Manufacturing Company is a little known producer of Tennis Rackets. the earnings and dividend growth prospects of the company are disputed by financial analysis, M/S Khanal, stock exchange broker, and Mr. Upadhyaya, Chartered Account, M/S Khanal is forecasting 10 percent growth in dividends indefinitely while Mr. Upadhyaya is predicting 20 percent growth in dividends, but only for the next two years, after which the growth rate is expected to decline to 5 percent for the indefinite future. Company's current dividend per share is Rs. 30. Stock with similar risk is currently priced to provide a 15 percent expected return. [5]

i. What is the value of company's stock according to M/S Khanal?

ii. What is the value of company's stock according to Mr. Upadhyaya?

iii. Assume that the company's stock now sells for Rs. 316.5 per share. If the stock is fairly priced at the present time, what is the implied perpetual dividend growth rate? What is the implied P/E (price earning ratio) on next year's earnings, based on this perpetual dividend growth assumption and assuming a 30 percent payout ratio?

Ans: (i) Rs. 660 (ii) Rs. 406.90 (iii) 3 times

12. 2061 Q.No. 3

The K Corporation's risk adjusted cost of capital is 10 percent. K's current cash dividends per share is Rs. 25, and have been growing at 3 percent per year. However, a technological break through is expected to increase. K's growth rate to 6 percent for the foreseeable future. K's common stock has been selling from Rs. 350 to Rs. 380.

i. What is the value of the stock price after K's new technological development announced publicity?

ii. Other things remaining same, do you think that stock price is rationale? Explain. [10]

Ans: (a) Rs. 662.50 (b) Rs. 367.86

13. 2060 Q.No. 3 (a)

Mr. Thapa is considering purchasing a 20-year 10 percent annuity that pays Rs.8,000 at the end of each year. How much will he be required to pay for this annuity?   [5]

Ans: Rs. 68,108.80

14. 2060 Q.No. 8 (c)

Mr. J. Maskey is trying to estimate the intrinsic value per share for a growth stock issued by the F. Corporation. He estimates that corporation will grow at 8 percent per year for 10 years and then level off. During this growth period the corporation will be more risky than the average company, and Maskey thinks 14 percent would be an appropriate capitalization rate. Corporation's earnings per share are currently Rs.3.00 and the corporation is paying 50 paisa per share cash dividend. What do you think its stock is worth if the price earnings ratio is 1.95 times?   [5]

Ans: Rs. 5.85

15. 2059 Q.No. 3

After comparing their prices and values, decide whether buying, no action, or selling is appropriate for the following common stocks.   [10]

Corporation's name	Market price of stock	Estimated value per share
Acme Corp.	Rs.87.75	Rs.90
Baker Inc.	Rs.11.125	Rs.13
Crown Corp.	Rs.31.75	Rs.40
Delta Inc.	Rs.19.50	Rs.25
Evans Corp.	Rs.44.25	Rs.30

Ans: Acme Corp and Baker Inc. = No action; Crown Corp. and Delta Inc. = Buy and Evans Corp. = Sell

16. 2059 Q.No. 8 (c)

Three automotive analysts, Mr. G. Gurung, Mr. D. Dahal, and Mr. N. Nakarmi, are all analysing the B. Corporation's common stock. They learned that Mr. D. Bajracharya, who founded the firm, laid down a no-debt financing policy that the firm adheres to even though Mr. Bajracharya passed away years ago. All three analysts agree that

a. Mr. Bajracharya has a beta that indicates that a capitalization rate of k =12 percent is appropriate for the stock,

b. Next year's earnings per share are expected to be Rs.7.50, and

c. B. Corporation is expected to retain one-third of its earnings to finance its expansion. However, the three analysts foresee different profit prospects for the Corporation. Mr. Gurung forecasts that the corporation will earn an internal rate of return of 20 percent for the foreseeable future. Mr. Dahal's forecast is more dire; he predicts a 10 percent rate of return. Mr. Nakarmi projects a 12 percent rate of return on Corporation's internal investments. Do the facts and assumptions that the three analysts are using imply significantly different intrinsic values for Corporation's stock? Explain.   [5]

Ans: Yes. The intrinsic value of Gurung, Dahal, Nakarmi are Rs. 93.8086, Rs. 57.6701 and Rs. 62.50

17. 2058 Q.No. 3

Mr. R. Singh is considering investing in the common stock of the ABC Company. Mr. Singh estimated the following cash flows for a 5 – year holding period: [10]

Year	Cash flows
1	Rs.2
2	3
3	4
4	4
5	2 + 73 = Rs.75 = (dividend + price)

a. If Singh's projections are accurate and if the appropriate return over this period for the stock is 14 percent, what should he currently pay per share for ABC?

b. If ABC's common stock is currently selling for Rs.52, what should Mr. Singh do?

Ans: Rs. 48.09 (b) Current market price per share (Rs. 52) is greater than intrinsic value per share (Rs. 48.09). Therefore, it is an overpriced stock and appropriate for short selling.

18. 2058 Q.No. 8 (c)

For a firm with earnings per share of Rs.10, dividends per share of Rs.6, a cost of equity capital of 10 percent, and an internal rate of return of 15 percent, calculate its value by using the dividend model. [5]

Ans: Rs. 150

PART V. OPTION FUTURES AND OTHER DERIVATIVES

15. OPTIONS MARKETS

1. 2069 Old Q.No. 9b

What is straddle? When is this strategy useful to investors? [10]

2. 2067 Q.No. 2

What are the major provisions of option contract? Also discuss major option strategies? [4+6]

● **Write notes on:**

3. 2070 Old Q.No. 6c /2064 Q.No. 6c

Convertible securities [5]

4. 2059 Q.No. 6 c

Warrants [5]

NUMERICAL PROBLEMS

5. 2070 Old Q.No. 9

The common stock of the ZBZ Corporation has a current price of Rs.40 and a standard deviation of return of 0.40. Assume a risk-free rate of 8 percent.

(a) Using the Black-Scholes model, determine the price of a 4 month call option that has a strike price of Rs.35.

(b) Determine the value of a put on ZBZ's stock that has a striking price of Rs.35.

(c) How does the payment of cash dividend affect the option value? [12+4+4]

Ans: (a) Rs. 7.1487 (b) Rs. 1.2282

6. 2067 Q.No. 9b (Old)

Friend Pun established the following spread on the Renco Corporation's stock: (i) Purchased one 3-month call option with a premium of Rs. 3 and an exercise price of Rs. 55, (ii) Purchased one 3-month put option with a premium of Rs. 0.50 and an exercise price of Rs. 45. The current price of Renco stock is Rs. 50.

Determine Friend's profit or loss if:

a. the price of Renco stays at Rs. 50 after 3 months,

b. the price of Renco falls to Rs. 35 after 3 months, and

c. the price of Renco rises to Rs. 60. [8]

Ans: (a) – Rs 350 (b) + Rs 650 (c) + Rs 150

16. OPTION VALUATION

NUMERICAL PROBLEMS

1. 2070 Q.No. 11

The following information exists for the call options on the XYZ Corporation's common stock.

Exercise price = Rs. 30

Price of underlining option stock = Rs. 35

Variance of the stock's return = 0.52

Time = 0.25 years

Risk free return = 0.10

a. Determine the value of call option with Black and Scholes Model.

b. If the current price of a call option on the XYZ Corporation's is Rs. 6, what should an investor decide?

c. Determine the value of put option on the XYZ's stock.

d. If the current value of the put option on XYZ' Corporation's stock is Rs. 0.75, what should an investor should decide?

e. How do risk-free rate, volatility and maturity of option contract affect the value of the option?   [10 + 2.5 × 4]

Ans: (i) Rs. 8.0145 (ii) As the option is undervalued, and investor should purchase the call option. (c) Rs. 2.2735 (d) Purchase.

2.   2069 Q.No. 7

HP stock is currently priced at Rs. 100 per share. Six months from now its price will be either Rs. 111.80 or Rs. 89.44. If the price rises to Rs. 111.80, then six months later the price will be either Rs. 125 or Rs. 100. If, however, the price initially falls to Rs. 89.44, then six months later the price will be either Rs. 100 or Rs. 80. The risk-free rate (continuously compounded) is 4.06 percent over each six month period. Using the binomial option pricing model, what it the fair value of a one-year call option on HP stock? (Assume the exercise price is Rs. 100).   [10]

Ans: Rs. 9.9858 per option

3.   2068 Q.No. 11

Consider the following information:

Time to expiration	6 months
Standard deviation	50% per year
Exercise price	Rs.50
Stock price	Rs. 50
Interest rate	10%

a. Find the value of call option using the Black and Scholes formula.
b. Find the value of put option.
c. Find the value of the call option if the time to expiration is 3 months instead of 6 months.
d. Explain how does (i) decrease in standard deviation, (ii) increase in exercise price, and (iii) increase in interest rate affect the value of call option.   [8+3×4]

Ans: (a) Rs. 8.1306 (b) Rs. 5.6906 (c) Rs. 5.7551

4.   2068 Old Q.No. 9b

Suppose you want to value a call and put options under the following circumstances:

Stock price, S_0 = Rs 100
Exercise price, X = Rs 95
Interest rate, r = 10% per year
Time to expiration, T = 6 months
Standard deviation, σ = 50% per year
Cash dividend of Rs 2 per share was paid at the end of 4th month.

i. Calculate the call option value and interpret.
ii. Calculate the put option value and interpret.
iii. If the call option is selling at Rs 15 and put option at Rs 12, are the call and put options unvalued or equally valued or overvalued? What is your decision?

Ans: Rs 17.4137 (ii) Rs 9.7121

5.   2067 Q.No. 9 a (Old)

Calculate the value of call options by using Black and Scholes model on Ruby Inc's common stock. The price of the underlying optioned stock is Rs. 35. The exercise price is Rs. 30. The standard deviation of the underlying optioned stock's return is 0.72. The time to expiration is three months, and the continuously compounded risk-free rate is 10 percent.   [8]

Ans: Rs. 8.0075

6.   2066 Q.No. 4

Assume that the price of Reliance stock today (t = 0) is Rs.100. Further assume that the stock will sell either at Rs.125 or Rs.80 after one year. The annual risk-free rate is 8 percent (compounded continuously). If the call option on Reliance has an exercise price of Rs.100 and expiration date of one year from now, the call will have a value of either Rs.25 (if Reliance stock sells at Rs.125) or Rs. 0 (if Reliance stocks sell at Rs.80). What is the fair value of the call at time 0?   [10]

Ans: Rs. 14.4028

7.   2065 Q.No. 4b

The stock of Western Telephone, a manufacturer of telephone sets, sells for Rs. 500 per share. Options exist which permit the holder to buy one share of Western at an exercise price of

Rs.400. These options will expire at the end of one year. at which time Western's stock will be selling either at Rs,800 or Rs.200. Assume, the risk-free rate is 5%. Based on these assumptions, find the value of the option.

8.   2064 Q.No. 8

Determining the value of a call options with the applications of Black-Scholes Model given the following information and explain the effects of change in current stock price and time to expiration on option value.

Exercise price (K) = Rs. 25; Selling price of the underlined stock (S) = Rs. 30; Continuously compounded risk free rate (R) = 9%; The standard deviation of the underlying stock (δ) = 0.45; Time to the option's maturity (T) = 3 months

Ans: Rs. 6.5182

9.   2063 Q.No. 8

Raymond Corporation has following information on common stock:

Stock price = Rs. 100; Exercise price = Rs. 95; Risk free rate = 10%; Time to expiry = 3 months Standard deviation = 0.50; Option price = Rs. 15

a.   Calculate the value of call option using Black-Scholes option pricing model. (Use normal distribution table)

b.   If current price of call option is Rs. 15, is the calculated option value desirable.   [20]

Ans: (a) Rs. 13.69 (b) not desirable because option is overvalued

10.   2062 Q.No. 4 (a)

You are attempting to value a call option with an exercise price of Rs. 100 and one year to expiration. The underlying stock pays no dividends, its current price is Rs. 100, and you believe it has a 50% chance of increasing to Rs. 120 and a 50% chance of decreasing to Rs. 80. The risk free rate of interest is 10%. Calculate the call option's value using the two-state stock price model.   [5]

Ans: Rs. 13.6364

11.   2062 Q.No. 8 (a)

What is the value of the call option according to the OPM?

Stock price	= Rs. 500
Exercise price	= Rs. 500
Time to expiration	= 6 months
Risk free rate	= 8%
Stock return variance	= 50% per year

[10]

Ans: Rs. 106.83

12.   2061 Q.No. 9

The following information exists for the call options on the Robot Corporation's common stock:

Exercise price	= Rs. 30
Price of the underlining optioned stock	= Rs. 35
Variance of the stock's return	= 0.52
Time	= 0.25 year
Risk free are rate (R)	= 0.10

i.   Determine the value of a call option with Black and Scholes' Model.

ii.   If the current price of a call on the Robot Corporation's stock is Rs. 6, what should an investor decide?

iii.   Determine the value of put option on the Robot Corporation's stock.

iv.   If the current value of the put option on the Robot Corporation's stock is Rs. 0.75, what should an investor should decide?   [20]

Ans: (i) Rs. 8.0145 (ii) As the option is undervalued, and investor should purchase the call option. (c) Rs. 2.2735 (d) The option is undervalued and the investor should purchase the put option.

13.   2060 Q.No. 9

The common stock of the ZBZ Corporation has a current price of Rs.40 and a standard deviation of 0.40. Assume a risk-free rate of 8 percent. Using the Black-Scholes model, determine the price of a 4-month call option that has strike price of Rs.35.   [20]

Ans: Rs. 1.2282

14. 2059 Q.No. 9

The stock of BBB Company is currently selling for Rs.65. A 3-month call option on the stock with an exercise price of Rs.60 has a premium of Rs.6.20. The standard deviation of returns on BBB stock has been estimated to be 0.18. Currently, the 3-month T-bill rate is 10 percent. (a) Is the option overvalued, undervalued, or priced correctly? (b) If you have confidence in your analysis, how would you react to your findings in (a)? [20]

Ans: (a) Rs. 6,8159 (b) At Rs. 6.20, the option is undervalued according to the Black-Scholes formula. The rational individual would buy the calls.

15. 2058 Q.No. 9

Determine the value of a call on a common stock with the following characteristics: Standard deviation of returns = 0.16; Exercise price = Rs.40; Risk-free rate = 0.10; Current price = Rs.42; Time to maturity = 6 months [20]

Ans: Rs. 4.4233

17. FUTURES MARKETS

N/A

PART VI. ACTIVE PORTFOLIO MANAGEMENT

18. PORTFOLIO PERFORMANCE EVALUATION

THEORETICAL QUESTIONS

1. 2068 Q.No. 2

What is portfolio performance? Describe briefly the conventional theory of performance evaluation. [4+6]

2. 2067 Q.No. 2 (Old)

Describe Treynor's portfolio measure and differentiate it from Sharpe's portfolio performance measure? [5+5]

3. 2063 Q.No. 9 (a)

Do you think that performance evaluation helps in achieving target return from portfolio selection? Explain. [10]

NUMERICAL PROBLEMS

4. 2070 Q.No. 7

Consider the following summary statistics about five investment portfolios.

Portfolio	Average return	Standard deviation	Beta	Correlation time in days
A	7%	3	0.4	0.89
B	10	8	1.0	0.91
C	13	6	1.1	0.90
D	15	13	1.2	0.95
E	18	15	1.4	0.88

Assume that the riskless rate of interest is 3 percent.
a. Which of the portfolios performed the best according to Sharpe's measure?
b. Which performed the best according to Treynor's performance measure?
c. What do these performance measures indicate? [4+4+2]

Ans: (a) 1.3333; 0.8750; 1.6667; 0.9231; 1 (b) 10; 7; 9.09; 10; 10.71

5. 2069 Old Q.No. 8b

Consider the following summary statistics about five investment portfolio.

Portfolio	Average return	Standard deviation	Beta	Correlation
Alpha (A)	7%	3	0.4	0.89
Beta (B)	10	8	1.0	0.91
Gamma (r)	13	6	1.1	0.90

Delta (Δ)	15	13	1.2	0.95
Epsilon (E)	18	15	1.4	0.88

Assume that the riskless rate of interest is 3.0 percent.

i. Which of the portfolios performed the best according to Sharpe's measure? The worst?

ii. Which performed the best according to Treynor's performance measure? The worst? [10]

Ans: (i)1.33, 0.875, 1.67, 0.923, 1 (ii) 10, 7, 9.09, 10, 10.71

6. 2068 Old Q.No. 9a

An analyst wants to evaluate portfolio X consisting entirely of common stocks of banking sector. S/He collected the following information during the past eight years. [8]

	Average annual rate of return	Standard deviation of return	Beta
Portfolio X	10%	18%	0.6
NEPSE	12	13	1.0
T-bills	6	N/A	N/A

i. Evaluate the portfolio X by using Sharp, Treynor and Jenson portfolio performance measures.

ii. Which performance measures did Portfolio X outperformed the market?

iii. Briefly explain the causes of conflicting results of three measures of portfolio performance.

Ans: (i) Sharpe measure for portfolio = 0.2222; Sharpe measure for market = 0.4615; Treynor measure for portfolio = 6.6667; Treynor measure for market = 6.00; Jenson's performance for portfolio = 0.4%; Jenson's performance for market = 0%; (ii) Treynor and Jenson

7. 2067 Q.No. 7

You want to evaluate portfolio A, consisting entirely of common stocks using both the Treynor and Sharpe measures of portfolio performance. The following table provides the average annual rate of return fro portfolio A, the market portfolio, and Treasury bills during the past 8 years.

	Average annual rate of return	Standard deviation of return	Beta
Portfolio A	12%	20%	0.60
Market portfolio	14	15	1.00
T-bills	8	15	1.00

a. Calculate the Treynor and Sharpe measures for both portfolios A and the market. Briefly explain whether portfolio A and the market. Briefly explain whether portfolio underperformed equaled, or outperformed the market on a risk adjusted basis using both the Treynor measure and the Sharpe measure.

b. Based on the performance of portfolio a relative to the market calculated in part (a), briefly explains the reason for the conflicting results when using the Treynor measure versus the Sharpe measure.

[6+4]

Ans: (a) 6.67; 6; 0.20; 0.40

8. 2066 Q.No. 5

Ms Preeti has been managing the portfolio of CIT Nepal for the last two years. She found that her portfolio had earned a return of 70.60 percent with a standard deviation of 41.31 percent and had a beta of 1.211. During the same period, the return on the market as a whole was 41.40 percent with a standard deviation of 19.44 percent. Assume that the risk-free rate was 12 percent.

a. Compute the Treynor measure for the portfolio and comment on Preeti's performance according to this measure. Show the result graphically.

b. Compute the Sharpe measure for the portfolio and comment on Preeti's performance according to this measure. Show the result graphically.

Ans: a. 48.3898; b. 1.4185

9. 2064 Q.No. 5

Following is the information on five securities. The parameters or opportunities sets are as follows:

Portfolio	Average return	Standard deviation	Beta	Correlation
M	7%	3	0.4	0.89
N	10	8	1.0	0.99
O	13	6	1.1	0.90
P	15	13	1.2	0.95
Q	18	15	1.4	0.86

a. Which of the portfolios perform best using Sharpe's measure?
b. According to Treynor's performance measure, which portfolios have the best ranking?
c. How you evaluate using above two portfolios investment performance measurement methods?   **Assume: Riskfree rate = 3%**

Ans: Assuming R_f = 5%; (a) Sharpe index: M = 1.3333, N = 0.8750, O= 1.6667, P= 0.9231 and Q = 1; O is the best portfolio (b) Treynor index: M = 10, N = 7, O= 9.09, P= 10 and Q = 10.71; Q is the best portfolio

10. 2061 Q.No. 5

Consider the following summary statistics above five investment portfolios.   [10]

Portfolios	Average return	Standard deviation	Beta	Correlation with the market
A	18%	15	1.4	0.88
B	15	13	1.2	0.95
C	13	6	1.1	0.90
D	10	8	1.0	0.91
E	7	3	0.5	0.89

Assume that the riskless rate of interest is 5 percent.
a. Which of the portfolios performed the best according to Sharpe's measures?
b. Which performed the best according to Treynor's performance measure?
c. Which conclusions do you draw from above calculations in (a) and (b)?

Ans: (a) Portfolio C (b) Portfolio A (c)

19. RISK MANAGEMENT AND HEDGING

● Write short notes on:

1. 2070 Q.No. 8c

Hedging   [5]

2. 2069 Q.No. 8c / 2067 Q.No. 8c

Risk management   [5]

■ TRUE AND FALSE

3. 2070 Q.No. 3

State whether the following statements are true or false. Give reasons for your answer. [2.5 × 4]
a. If all securities are fairly priced, all must offer equal expected rates of return.
b. The stated yield to maturity and realized compound yield to maturity of a zero coupon bond will always be equal.
c. You can construct a portfolio with a beta of 0.75 by investing 0.75 of the investment budget in T-bills and the remainder in the market portfolio.
d. With a fixed risk-free rate, doubling the expected rate of return and standard deviation of the risky portfolio will double the Sharpe ratio.

Ans: (a) F (b) T (c) F (d) F

4. 2069 Q.No. 3

State whether the following statements are true or false. Give reasons for your answers. [4 × 2.5]
a. Lease obligation and college education both are financial asset.   *Investment Environment*
b. Last year you earned a nominal rate of interest of 20 percent on your money. The inflation rate was 10 percent in the same period. The exact actual growth rate of your purchasing power was 10 percent.   *Bond Prices and Yields*
c. Purchasing put options and writing call options are both bullish strategies.   *Option Valuation*

d. The average return on portfolio 'P' is 35 percent and the standard deviation 42 percent. If the T-bill rate during the period was 6 percent, the Sharpe's performance measure for portfolio P is 0.69.

Portfolio Performance Evaluation

5. 2068 Q.No. 3

State whether the following statements are true or false. Give reasons for your answer. [4 × 2.5]

a. A municipal bond carries a coupon of 5 percent and is trading at par. The equivalent taxable yield to a taxpayer who belongs to 30 percent tax bracket is 7.14 percent.

Markets and Instruments

b. 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 500,000 shares outstanding. The net assets value per share is Rs. 23.

Mutual Funds and Other ...

c. Security A and security B have 0.5 correlations. Security C and security D have – 0.5 correlations. We can achieve better portfolio diversification when we form portfolio between Security A and security B.

Optimal Risky Portfolios

d. Warrants are essentially put options issued by firms.

Options Markets

Ans: (a) True (b) True (c) False (d) False

6. 2067 Q.No. 3

State whether the following statements are true or false. Give reasons for your answer. [4×2.5]

a. Nepse is value-weighted index.

Market and Instrument

b. Suppose you short sell 100 shares of Infosys, now selling at Rs. 1,150 per share. The maximum loss per share if you simultaneously place a stop-buy order at Rs. 1,160 is Rs. 10.

Trading of Securities

c. Assume that a January call option on Standard chartered stock with an exercise price of Rs. 2,060 on expiration date, the option holder does not incur any loss.

Options Markets

d. Treynor's measure is calculated by dividing excess return of the portfolio by standard deviation of the portfolio.

Portfolio Performance Evaluation

Ans: (a) True (b) True (c) False (d) False