[This question paper contains 8 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 5348 **G**

Unique Paper Code : 12277510

Name of the Paper : Financial Economics

Name of the Course : **B.A. (Hons.) Economics – DSC**

Semester : V

Duration : 3 Hours Maximum Marks : 75

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. **All** questions carry equal marks.
3. Attempt any **five** questions by selecting at least **two** questions from each section.
4. Part of the questions to be attempted together.
5. Use of non-programmable Scientific Calculator is allowed.

P.T.O.

Section–I

1. (a) Explain the concept of duration. Derive an expression to explain the interest rate sensitivity of price of a bond in terms of duration? (3+5)

(b) Mr. Pai designs a pension scheme that will provide his customers with an annual payment of $10,000 over a 10-year period. The first payment is scheduled in exactly 5 years from today. Mr. Pai wants to immunize the exposure. The current interest rate is 10% per year. (3+4)

(i) What is the duration of its obligation?

(ii) If Mr. Pai plans to use 5-year and 20-year zero-coupon bonds to construct the immunized portfolio, how much money should he invest in each bond? What will be the face value of the holdings in each zero-coupon bond?

2. (a) Shorting an asset converts a negative rate of return into a profit. Is this statement True or False? Explain with an example if it is true otherwise give reasoning if it is false. (4)

(b) Suppose that you borrow $10,000 in a four year loan. The bank requires you to pay the loan in four equal repayment at a 10% annual interest rate. Find the annual payment that is sufficient to repay the loan. What is the amount of interest paid during the last year? (7)

(c) "An asset on the capital market line has only systematic risk. Assets with non- systematic risk lie to the right of the line". Explain and illustrate this relationship. (4)

3. (a) Explain 'Two fund theorem'? What is its significance in the Markowitz model? (5)

(b) Assume that the following assets are correctly priced according to the security market line. Derive the equation for security market line. What is the expected return on an asset with a beta of 2?

$\bar{R}_1 = 6\%, \beta_1 = 0.5$

$\bar{R}_2 = 12\%, \beta_2 = 1.5$ (6)

(c) Derive an expression for modified duration for a fixed income instrument where payments are made m times per year and the yield based on those same periods is λ. (4)

4. (a) Derive the CAPM pricing formula. Is CAPM pricing formula linear? Explain. (6)

(b) Allen will start receiving a pension of $3,000 a year, exactly ten years from now. The payment will continue for sixteen year periods. What is the present value of the pension, if Allen's interest rate is 10 per cent? (5)

(c) What is immunization of a portfolio? What problems does it solve? (4)

Section–II

5. (a) Explain the strip and strap combination of option trading strategies. Create a pay-off table for both. (6)

(b) Suppose that the risk-free rate is 9% per annum with continuous compounding and that the dividend yield is 3% per annum. The index is standing at 700 and the future price for a contract deliverable in four months is \$710. What arbitrage opportunities does this scenario create? (5)

(c) Explain put-call parity for a European option. (4)

6. (a) Explain the factors that affect the stock call and put option prices. (7)

(b) A four-month European put option on a dividend paying stock is currently selling for $2. The stock price is $52, the strike price is $55, and a dividend of $2 is expected in 2 months. The risk-free interest rate is 6% per annum for all maturities. What opportunities are there for an arbitrageur? (5)

(c) What is meant by basis risk when futures are used for hedging? (3)

7. (a) What is minimum variance hedge ratio and how it is determined? Also explain what is meant by hedge effectiveness? What will happen to minimum variance hedge ratio if standard deviation of change in future price is high? (7)

(b) A company has a $30,00,000 portfolio with a beta of 1.4. It prefers to use future contracts of Nifty 50 to hedge its risk. The current value of the index is for delivery of Rs. 200 times the index.

The risk can be minimized if the company shorts 20 futures. What is the index futures price? What should the company do if it wants to reduce the beta of the portfolio to 0.5? (6)

(c) An individual sells a European put with a strike price of \$50 for \$4. For what values of stock price will the individual make positive profits? (2)

8. (a) Use put-call parity to relate the initial investment for a bull spread created using calls to the initial investment for a bull spread created using puts. (7)

(b) A stock price is currently \$20, and it is known that at the end of 3 months it will be either \$22 or \$18. We are interested in valuing a European call option to buy the stock for \$21 in 3 months.

(i) Draw one-step tree stock and option prices.

(ii) Calculate the current value of the option.

(3+5)