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# 1511E1252

Candidate's Seat No :_____

M.Sc. Sem.-3 Examination

503

A. M. S.

Time : 2-30 Hours] November-2025 [Max. Marks : 70

**Instructions:** All questions are compulsory. Use of non-programmable scientific calculator is allowed.

**Q.1** **(a)** State (only) the Principal of Consistency. **(07)**
Consider Rs.4,600 is invested at time 0 and the proceeds at time 10 are Rs. 8,200. Calculate accumulation factor $A(7,10)$ if

$$A(0,9) = 1.8, A(2,4) = 1.1, A(2,7) = 1.32, A(4,9) = 1.45$$

**(b)** Define Net Present Value (NPV). **(07)**
Compute the Net Present Value for a project with a net investment of Rs. 1,00,000 and net cash flow in year one is Rs. 55,000; for year two is Rs. 70,000 and for year three it is Rs. 15,000. Further, the company's cost of capital is 10%.
(PVIF 10% for three years are 0.909, 0.826 and 0.751)

**OR**

**(a)** Explain in detail the comparison of NPV and IRR with suitable example. **(07)**

**(b)** Calculate the following cash flow for a project. **(07)**

| Year | Net cash flows (Rs.) |
|---|---|
| 0 | -100 |
| 1 | 10 |
| 2 | 60 |
| 3 | 80 |

Find out the modified internal rate of return for the project. The project cost of capital is 10%.

**Q.2** **(a)** The Expectations and Segmented Market Hypothesis are actually extreme versions of the Preferred Habitant Hypothesis. Discuss. **(07)**

**(b)** A zero-coupon bond of Rs. 1,00,000 has a term to maturity of six years and a market yield of 8 percent at the time of issue. **(07)**
a) What is the issue price?
b) What is the Macaulay duration of the bond?

**OR**

**(a)** Explain in brief the Macaulay duration of the bond and write an expression that establishes the relation between Macaulay duration and Modified duration of the bond. **(07)**

**(b)** The price of a Rs.1,000 par bond carrying a coupon rate of 7 percent and maturing after five years is Rs.1040. **(07)**
a) What is the approximate YTM?
b) What will be the realized YTM if the reinvestment rate is 6 percent?

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**Q.3** **(a)** Find Treynor Ratio and explain which manager is preferable and why? **(07)**

| Managers | Average Annual Return | Beta |
|---|---|---|
| Manager A | 10% | 0.90 |
| Manager B | 14% | 1.03 |
| Manager C | 15% | 1.20 |

**(b)** Explain the Markowitz theory indicating its assumptions, Efficient Portfolio, Efficient Frontier and the limitations of the theory. **(07)**

**OR**

**(a)** Write detailed theory on: The Capital Asset Pricing Model (CAPM) **(07)**

**(b)** Explain Security Market Line (SML) and Capital Market Line (CML) with its graphical representation. **(07)**

**Q.4** **(a)** In standard notations, derive the Black-Scholes Partial Differential Equations. **(07)**

**(b)** In usual notations explain and derive the derivative price formula by the method of Replicating portfolio. **(07)**

**OR**

**(a)** Define: Put-Call Parity. Explain with suitable example the concept of put-call parity formula for a European option. **(07)**

**(b)** Using the following data, compute the price of the associated European call option by Black-Scholes formula. $S_0 = 1500, X = 1650, r = 0.065, T = 6$ month, $\sigma = 0.30$ (Use the tabulated value: $N(d_1) = 0.4246, N(d_2) = 0.3438$) **(07)**

**Q.5** Attempt any **SEVEN** out of **TWELVE:** **(14)**

**(1)** Explain the concept of Diversification with suitable example.
**(2)** What is the meaning of market beta?
**(3)** What is Present Value and Future Value for an Annuity?
**(4)** Write (only) formula for Jensen's Index and Treynor measure.
**(5)** State (only) the interpretation of Profitability Index.
**(6)** What is accrued interest?
**(7)** Define: Implied Volatility
**(8)** Define: Minimum Variance Portfolios
**(9)** Define: Term Structure of Interest Rate
**(10)** Define: Yield Curve
**(11)** State the difference between Forwards and Futures contracts.
**(12)** Write the expression representing expected value and variance of Log-normal distribution.

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