

AFM/SFM Test-5

Mission 80+ in AFM/SFM for Nov/Dec 2024 attempt

Time Allowed – 75 Min (1.25 Hr)

Maximum Marks - 40

All Questions are Compulsory.

Working Notes should form part of the respective answer.

PART I – Case Scenario based MCQs (12 Marks)

In our CA Final AFM paper / CMA Final SFM Paper conducted by Institute, it is not required to show the working for MCQs. However, for our test series, we highly recommend that students provide detailed workings.

This allows us to better evaluate your preparation and understanding of the concepts.

Case Scenario I:

Following data is available in respect of a stock:

Current price of one share	₹ 200
Strike price of option	₹ 180
Risk free rate of interest 10% p.a. (on continuous compounding basis)	
Time to Expiration	6 months
Put price	₹10
Call price	₹32

Given:

$$e^{-0.10} = 0.9048 \text{ and } e^{0.10} = 1.1052$$

$$e^{-0.05} = 0.9512 \text{ and } e^{0.05} = 1.0513$$

- (i) Theoretical current ^(fair) price of call option is 2M
(a) ₹28.78 (b) ₹38.78
(c) ₹20.76 (d) None of the above
- (ii) Put option is 1M
(a) over-priced (b) under priced
(c) at fair price (d) insufficient data
- (iii) Whether arbitrage is possible from this pricing position? 1M
(a) Yes, by writing put option (b) Yes, by writing call option
(c) Yes, by purchasing put option (d) No arbitrage possible
- (iv) Arbitrage Gain will be? 2M
(a) ₹53.38 (b) ₹7.13
(c) ₹ 6.78 (d) None

Case Scenario: II

An Indian exporter has exported goods to USA. The exporter will be receiving USD 1 Million in 90 days. Premium for a dollar put option with a strike price of ₹80.00 and a 90 days settlement is ₹3.

90 days forward rate of \$1 as of today = ₹ 77

The Cost of capital is 18% p.a.

- (i) If exporter anticipates the spot rate after 90 days to be ₹76.00. He should **1M**
 (a) hedge in option market
 (b) remain unhedged
 (c) Hedge using forward contract
 (d) hedging in option & hedging in forward contract will give same net inflow.
- (ii) At what spot rate on maturity will it break even for the buyer of the put option (as compared to remain unhedged)? **2M**
 (a) 77
 (b) 76.46
 (c) 76.865
 (d) 80
- MCQ-3** Which of the following is true about Security Market Line (SML)? **1M**
 (a) Intercept = Risk-free return; Slope = Risk premium
 (b) Intercept = Risk Premium; Slope = Risk-free return
 (c) Intercept = Beta; Slope = Risk Premium
 (d) Intercept = Risk-free Return; Slope = Beta
- MCQ-4** The value of beta of a security does not depend on **1M**
 (a) S.D. of Market (b) S.D. of Security
 (c) Risk-free rate (d) Correlation between the security and the market
- MCQ-5** Which of the following can be referred to as the *time decay* of an option? **1M**
 (a) Delta (b) Gama
 (c) Theta (d) Rho

PART II – Descriptive Questions (28 Marks)

1. The stock of Sunshine Ltd. is currently trading at ₹1,340 and call option exercisable in three months' time has a strike price of ₹1,300. The standard deviation of continuously compounded stock price change for Sunshine Ltd. is estimated to be 60% per year. The risk-free rate is 8%. 7

You are required to compute the value of a three-month call option on the stock of Sunshine Ltd. using Black Scholes model,

Note: Extracted from the tables:

(1) Natural logarithm: $\text{Ln} (0.9701) = -0.0303$

$\text{Ln} (1.0308) = 0.0303$

(2) Value of e^{-x} : $e^{-0.02} = 0.9802$, $e^{-0.016} = 0.9841$

(3) For $N(X)$ where $X \geq 0$: $N(0.3177) = 0.6246$

$N(0.0177) = 0.5071$

Where $X \leq 0$: $N(-0.3177) = 0.3754$

$N(-0.0177) = 0.4929$

2. Consider a two-year **American call option** with a strike price of ₹100 on a stock the current price of which is also ₹100. Assume that there are two time periods of one year and in each year the stock price can move up or down by equal percentage of 30%. The risk-free interest rate is 6%. 7

Using binominal option model, calculate the probability of price moving up and down. Also draw a two-step binomial tree showing prices and payoffs at each node.

3. An American firm is under obligation to pay interests of Can\$ 5,00,000 on 31st July. The firm is risk averse and its policy is to hedge the risks involved in all foreign currency transactions. The finance manager of the firm is thinking of hedging the risk considering two methods i.e. fixed forward or option contracts. 7

It is now June 30 following quotations regarding rates of exchange, US\$ per Can\$ from the firm's bank were obtained:

Spot	1 month forward
0.9284 – 0.9288	0.9301

Price for a CAN\$ / US\$ option on a U.S. stock exchange (cents per CAN\$, payable on purchase of the option, contract size Can\$ 50,000) are as follows

Strike price (US\$ / CAN\$)	Calls	Puts
0.93	1.56	0.88
0.94	1.02	NA
0.95	0.65	1.92

According to the suggestion of finance manager if options are to be used at a strike price of 94 cents and for the remainder uncovered by the options the firm would bear the risk itself. For this it would use forward rate as the best estimate of spot. Transaction costs are ignored.

Recommended, which of the above two methods would be appropriate for the American firm to hedge its foreign exchange risk on the interest payments.

4. Following is the information related to three mutual funds

YEAR	MF – A	MF – B	MF – C
2020	10%	5%	14%
2021	8%	10%	10%
2022	12%	8%	18%

Correlation between market and mutual fund: -

	MF – A	MF – B	MF – C
Correlation with market	0.45	0.25	0.65

Variance of the market is 9% and rate of return of government bond is 7%

You are required to Rank the mutual fund using Sharpe's ratio and Treynor's ratio.