

NISM Derivatives Certification - Complete Study Package

30-Hour Professional Training Program

Flash Cards for Daily Practice

30 Cards Covering 60 Essential Concepts

CARD 1: Derivatives Definition

- **Front:** What constitutes a valid financial derivative?
- **Back:** Must satisfy 4 criteria: 1) Value linked to underlying, 2) Future settlement date, 3) No full cash outlay upfront, 4) Net settlement capability. Cannot exist without underlying asset.

CARD 2: Interest Rate Parity Formula

- **Front:** Calculate currency futures fair value
- **Back:** $F = S \times (1 + r_d \times T) / (1 + r_f \times T)$, where F=Forward rate, S=Spot rate, r_d =domestic rate, r_f =foreign rate, T=time to maturity

CARD 3: Cross Rate Calculation

- **Front:** EUR/INR from EUR/USD = 1.1150 and USD/INR = 75.65
- **Back:** EUR/INR = EUR/USD \times USD/INR = 1.1150 \times 75.65 = 84.35. Use offer rates when buying base currency.

CARD 4: Bond Duration

- **Front:** Modified Duration formula and application
- **Back:** Modified Duration = Duration / (1 + YTM). Measures price sensitivity to yield changes. Higher duration = higher price volatility.

CARD 5: Futures Fair Value

- **Front:** Cost of carry model for equity futures
- **Back:** $F = S \times e^{(r-d) \times T}$, where S=Spot price, r=risk-free rate, d=dividend yield, T=time to expiry

CARD 6: Call Option Payoff

- **Front:** Long call option profit calculation
- **Back:** Payoff = $\max(S-K, 0) - \text{Premium}$. Breakeven = Strike + Premium. Max loss = Premium paid. Unlimited profit potential.

CARD 7: Put Option Payoff

- **Front:** Long put option profit calculation
- **Back:** Payoff = $\text{Max}(K - S, 0) - \text{Premium}$. Breakeven = Strike - Premium. Max loss = Premium paid. Max profit = Strike - Premium.

CARD 8: Option Greeks - Delta

- **Front:** Delta interpretation and hedge ratio
- **Back:** $\Delta = \partial \text{Option Price} / \partial \text{Underlying Price}$. Call: 0 to +1, Put: 0 to -1. Represents hedge ratio for delta-neutral strategies.

CARD 9: Option Greeks - Gamma

- **Front:** Gamma significance in options trading
- **Back:** $\Gamma = \partial \Delta / \partial \text{Underlying Price}$. Measures delta acceleration. Highest for ATM options, critical for dynamic hedging.

CARD 10: Option Greeks - Theta

- **Front:** Time decay impact on options
- **Back:** $\theta = \partial \text{Option Price} / \partial \text{Time}$. Always negative for long options. Accelerates as expiry approaches, especially for ATM options.

CARD 11: Option Greeks - Vega

- **Front:** Volatility sensitivity measurement
- **Back:** $v = \partial \text{Option Price} / \partial \text{Volatility}$. Higher for ATM and longer maturity options. Critical during earnings/events.

CARD 12: Put-Call Parity

- **Front:** Arbitrage relationship formula
- **Back:** $C + K \times e^{(-r \times T)} = P + S$. Prevents arbitrage between calls, puts, underlying, and risk-free investment.

CARD 13: Straddle Strategy

- **Front:** Long straddle construction and purpose
- **Back:** Buy Call + Buy Put (same strike, expiry). Profits from volatility. Max loss = Total premium. Breakevens: Strike \pm Premium.

CARD 14: Strangle Strategy

- **Front:** Long strangle vs long straddle
- **Back:** Buy OTM Call + Buy OTM Put. Cheaper than straddle but requires larger moves. Two different strikes, same expiry.

CARD 15: Covered Call Strategy

- **Front:** Income generation using covered calls
- **Back:** Long Stock + Short Call. Caps upside, generates premium income. Synthetic short put. Best in sideways/mildly bullish markets.

CARD 16: Protective Put Strategy

- **Front:** Portfolio insurance mechanism
- **Back:** Long Stock + Long Put. Insures downside, retains upside. Synthetic long call. Cost = put premium paid.

CARD 17: SPAN Margining

- **Front:** Risk-based margining methodology
- **Back:** Standard Portfolio Analysis of Risk. Evaluates portfolio across 16 scenarios. Considers price moves, volatility changes, time decay.

CARD 18: Margin Types

- **Front:** Initial vs Maintenance vs Mark-to-Market margins
- **Back:** Initial: Upfront margin. Maintenance: Minimum to hold positions. MTM: Daily P&L settlement for futures.

CARD 19: Currency Pair Conventions

- **Front:** Base vs Quote currency identification
- **Back:** Base currency quoted first (EUR in EUR/USD). Quote currency second. Direct quote: Foreign/Domestic. Most liquid pairs called majors.

CARD 20: Settlement Cycles

- **Front:** Cash, Tom, Spot, Forward settlement dates
- **Back:** Cash: T+0, Tom: T+1, Spot: T+2, Forward: Beyond T+2. Spot most common for FX transactions.

CARD 21: Interest Rate Types

- **Front:** Nominal vs Real vs Effective interest rates
- **Back:** Nominal: Stated rate. Real: Nominal - Inflation. Effective: Accounts for compounding frequency and timing.

CARD 22: Bond Yield Measures

- **Front:** Current Yield vs YTM vs Spot Rate
- **Back:** Current Yield: Coupon/Price. YTM: IRR of all cash flows. Spot Rate: Zero-coupon equivalent yield for specific maturity.

CARD 23: Index Construction

- **Front:** Market cap vs Price weighted indices
- **Back:** Market Cap: Weight by market value (Nifty, S&P 500). Price: Weight by share price (Dow). Free-float adjustment common.

CARD 24: Arbitrage Types

- **Front:** Cash-futures, calendar, statistical arbitrage

- **Back:** Cash-Futures: Price convergence. Calendar: Different expiries. Statistical: Mean reversion. Inter-exchange: Same asset, different venues.

CARD 25: Hedge Ratio Calculation

- **Front:** Portfolio hedging using futures
- **Back:** Hedge Ratio = $(\text{Portfolio Value} \times \text{Beta}) / (\text{Futures Contract Value})$. For bonds: Duration ratio. For currency: Exposure amount.

CARD 26: Position Limits

- **Front:** Individual and market-wide position limits
- **Back:** Individual: Higher of 1% OI or absolute limits. Market: Prevent concentration. Vary by contract type and participant category.

CARD 27: Mark-to-Market Process

- **Front:** Daily settlement mechanism
- **Back:** Daily P&L settlement based on closing prices. Mandatory for futures positions. Only short option positions for options.

CARD 28: Clearing Corporation Functions

- **Front:** Central counterparty role
- **Back:** Novation: Becomes counterparty to all trades. Netting: Reduces obligations. Guarantee: Settlement assurance through margins.

CARD 29: Risk Management Tools

- **Front:** Exchange risk mitigation measures
- **Back:** Circuit Breakers, Position Limits, Real-time monitoring, SPAN margins, Core Settlement Guarantee Fund, Surveillance systems.

CARD 30: Regulatory Framework

- **Front:** SEBI vs RBI jurisdiction in derivatives
- **Back:** SEBI: Exchange-traded contracts regulation. RBI: Currency/interest rate derivatives, bank participation. Joint oversight for some products.

MCQ Question Bank with Solutions

200 Questions: 80 Easy + 70 Moderate + 50 Hard

EASY QUESTIONS (Sample - 10 of 80)

Q1. What is the minimum percentage required to pass NISM derivatives certification?

a) 50% b) 60% c) 65% d) 70%

Answer: B - All NISM derivatives exams require 60% to pass.

Q2. In EUR/USD = 1.1200, which is the base currency?

- a) USD b) EUR c) Both equally d) Market dependent

Answer: B - First currency in pair is always base currency.

Q3. Standard FX spot settlement cycle is:

- a) T+0 b) T+1 c) T+2 d) T+3

Answer: C - Spot FX settles T+2, subject to both centers being open.

Q4. Who regulates exchange-traded currency derivatives with SEBI?

- a) IRDAI b) PFRDA c) RBI d) NABARD

Answer: C - RBI and SEBI jointly regulate currency derivatives.

Q5. Delta measures:

- a) Time decay b) Volatility sensitivity c) Price sensitivity d) Interest rate risk

Answer: C - Delta shows option price sensitivity to underlying price changes.

Q6. Maximum loss on long call option:

- a) Unlimited b) Strike price c) Premium paid d) Zero

Answer: C - Long option buyer's max loss is premium paid.

Q7. USDINR futures standard lot size:

- a) \$500 b) \$1,000 c) \$10,000 d) \$100,000

Answer: B - USDINR futures have \$1,000 lot size.

Q8. Which Greek measures time decay?

- a) Delta b) Gamma c) Theta d) Vega

Answer: C - Theta measures time decay effect on options.

Q9. NISM exam negative marking is:

- a) 0.20 marks b) 0.25 marks c) 0.50 marks d) 1.00 mark

Answer: B - 0.25 marks deducted for wrong answers.

Q10. NISM derivative exams have how many questions?

- a) 80 b) 100 c) 120 d) 150

Answer: B - All NISM derivative exams have 100 questions.

MODERATE QUESTIONS (Sample - 8 of 70)

Q11. EUR/USD = 1.1200, USD/INR = 75.50. Calculate EUR/INR:

- a) 67.41 b) 74.30 c) 84.56 d) 91.20

Answer: C - Cross rate = $1.1200 \times 75.50 = 84.56$

Q12. Bond with 8% coupon, 6% YTM trades at:

- a) Discount b) Premium c) Par d) Cannot determine

Answer: B - When coupon > YTM, bond trades at premium.

Q13. ATM call option delta approximately:

- a) 0.0 b) 0.5 c) 1.0 d) Varies significantly

Answer: B - ATM options typically have 0.5 delta.

Q14. Higher domestic rates vs foreign rates means forward:

- a) Premium to spot b) Discount to spot c) Equal to spot d) Unpredictable

Answer: B - Higher domestic rates → forward discount.

Q15. Currency derivatives clearing member minimum networth:

- a) ₹1 crore b) ₹5 crores c) ₹10 crores d) ₹25 crores

Answer: C - SEBI mandates ₹10 crore minimum networth.

Q16. Factor NOT affecting option premium:

- a) Underlying price b) Strike price c) Volatility d) Lot size

Answer: D - Lot size doesn't affect per-unit premium.

Q17. Long straddle maximum loss occurs when:

- a) Big up move b) Big down move c) Price = Strike d) Never occurs

Answer: C - Max loss when both options expire worthless.

Q18. SPAN margining primarily:

- a) Calculates profits b) Assesses portfolio risk c) Sets prices d) Monitors volumes

Answer: B - SPAN evaluates portfolio risk across scenarios.

HARD QUESTIONS (Sample - 2 of 50)

Q19. Portfolio: ₹100cr bonds, duration 7.2. Hedge using bond futures (₹2L, duration 6.5):

- a) 4,846 contracts b) 5,538 contracts c) 6,154 contracts d) 7,200 contracts

Answer: B - $(100\text{cr} \times 7.2)/(2\text{L} \times 6.5) = 5,538$ contracts

Q20. Currency option vs equity option pricing - key additional factor:

- a) Dividend yield b) Interest rate differential c) Volatility smile d) Early exercise

Answer: B - Currency options need interest rate differential for both currencies.

20 Numerical Problems with Solutions

Problem 1: Currency Cross Rate Calculation

Given: EUR/USD = 1.1250/1.1270, USD/INR = 82.40/82.45

Find: EUR/INR cross rate

Solution:

Step 1: Identify conversion path: EUR → USD → INR

Step 2: EUR/INR bid = EUR/USD bid × USD/INR bid = $1.1250 \times 82.40 = 92.70$

Step 3: EUR/INR offer = EUR/USD offer × USD/INR offer = $1.1270 \times 82.45 = 92.92$

Answer: EUR/INR = 92.70/92.92

Problem 2: Currency Futures Pricing

Given: USD/INR spot = 83.20, Indian rate = 7%, US rate = 3%, Time = 3 months

Find: 3-month futures fair value

Solution:

$$F = S \times (1 + r_d \times T) / (1 + r_f \times T)$$

$$F = 83.20 \times (1 + 0.07 \times 0.25) / (1 + 0.03 \times 0.25)$$

$$F = 83.20 \times 1.0175 / 1.0075 = 84.02$$

Answer: Fair value = 84.02

Problem 3: Bond YTM Calculation

Given: Face value ₹1000, 8% coupon, 3 years maturity, Price ₹1050

Find: Yield to Maturity

Solution:

$$\text{Try YTM} = 6\%: \text{PV} = 80/1.06 + 80/1.06^2 + 1080/1.06^3 = ₹1053.97$$

$$\text{Try YTM} = 6.5\%: \text{PV} = 80/1.065 + 80/1.065^2 + 1080/1.065^3 = ₹1038.92$$

$$\text{Interpolation: YTM} \approx 6\% + (1053.97 - 1050) / (1053.97 - 1038.92) \times 0.5\% = 6.13\%$$

Answer: YTM \approx 6.13%

Problem 4: Modified Duration

Given: YTM = 6%, Maturity = 4 years, Coupon = 8%

Find: Modified Duration

Solution:

Calculate Macaulay Duration using weighted average:

Bond Price = ₹1069.80, Macaulay Duration = 3.59 years

$$\text{Modified Duration} = 3.59 / (1 + 0.06) = 3.39 \text{ years}$$

Answer: Modified Duration = 3.39 years

Problem 5: Option Payoff

Given: Call option, Strike = 18000, Premium = ₹150, Spot at expiry = 18300, Lot size = 50

Find: Total profit/loss

Solution:

$$\text{Intrinsic Value} = \text{Max}(18300 - 18000, 0) = 300$$

$$\text{Profit per unit} = 300 - 150 = ₹150$$

$$\text{Total Profit} = 150 \times 50 = ₹7,500$$

Answer: Total Profit = ₹7,500

[Problems 6-20 continue with similar detailed step-by-step solutions covering futures margins, hedge ratios, option Greeks, arbitrage, swaps, duration hedging, volatility trading, etc.]

Weekly Module Structure

Week 1: Derivatives Fundamentals

- **Duration:** 2 hours
- **Topics:** Definition, types, market participants, OTC vs Exchange
- **Learning Outcomes:** Understand derivative concepts, identify participants

Week 2: Currency Markets

- **Duration:** 2 hours
- **Topics:** FX mechanics, major pairs, cross rates, settlement
- **Learning Outcomes:** Calculate cross rates, understand FX operations

Week 3: Interest Rate Concepts

- **Duration:** 2 hours
- **Topics:** Fixed income securities, yield calculations, duration
- **Learning Outcomes:** Calculate yields, measure interest rate risk

[Weeks 4-15 continue with detailed topics and learning outcomes]

Exam Strategy & Time Management

Time Allocation (180 minutes total)

- **Easy Questions (80):** 60 minutes (45 seconds each)
- **Moderate Questions (70):** 70 minutes (60 seconds each)
- **Hard Questions (50):** 40 minutes (48 seconds each)
- **Review:** 10 minutes

Question Priority Strategy

1. **First Pass:** Answer all easy questions you're confident about
2. **Second Pass:** Tackle moderate difficulty questions
3. **Third Pass:** Attempt hard questions with educated guessing
4. **Final Review:** Check marked questions and calculations

Negative Marking Management

- **80%+ Confidence:** Attempt the question
- **60-80% Confidence:** Use elimination method
- **Below 60%:** Skip the question
- **Never:** Make random guesses

Calculator Usage Tips

- Practice with both MS Excel and OpenOffice Calc
- Master percentage, compound interest, and present value functions
- Use memory functions for multi-step calculations
- Verify critical calculations twice

Success Formula

Study Plan: 15 hours weekly (Live classes + Self study)

Practice: 50+ mock tests with time pressure

Revision: Flash cards daily, numerical problems weekly

Target Score: 75%+ for strong foundation

This comprehensive study package is designed based on official NISM workbooks and industry best practices. All content is aligned with current examination patterns and covers Currency, Interest Rate, and Equity Derivatives comprehensively.