

# Expert Certification Exam

## Qualified Financial Trader Expert Certification

Instructions: Answer all questions. Time limit: 3 hours.

### Section A: Quantitative Analysis (40 marks)

1. Derive the Black-Scholes formula for European call options. \$\$ marks\$\$
2. Explain the concept of implied volatility and its role in options pricing. \$\$ marks\$\$
3. Describe the GARCH(1,1) model and its applications in volatility forecasting. \$\$ marks\$\$
4. Calculate the optimal portfolio weights using mean-variance optimization. \$\$ marks\$\$

### Section B: Trading Strategies (35 marks)

5. Design a statistical arbitrage strategy using cointegration analysis. \$\$ marks\$\$
6. Compare and contrast momentum and mean reversion strategies. \$\$ marks\$\$
7. Evaluate the risks associated with high-frequency trading. \$\$ marks\$\$

### Section C: Risk Management (25 marks)

8. Explain Value at Risk (VaR) and Expected Shortfall measures. \$\$ marks\$\$
9. Discuss tail risk hedging strategies for institutional portfolios. \$\$ marks\$\$

### Section D: Market Microstructure (20 marks)

10. Analyze the impact of order flow on price formation. \$\$ marks\$\$
11. Describe the mechanics of market making and inventory management. \$\$ marks\$\$

Total Marks: 120