QUANTITATIVE FINANCE PROGRAM

MASTER EXAM QUESTIONS

EFFECTIVE AS OF JUNE 1, 2026

1	Expected value of a random variable – for discrete variable and for continuous variable. Properties of expected value. Expected value of product of two random variables.
2	Stochastic processes in discrete and continuous time. Definition and interpretation of Ito stochastic processes
3	Heteroscedasticity and autocorrelation of random terms. Comment on definitions of both terms. What statistics are used to test heteroscedasticity or autocorrelation of random terms?
4	Stationarity of stochastic processes. Why stationary processes are of special interest for economists? How the stationarity is tested? Give examples of transformations of nonstationary processes into stationary ones.
5	Explain what are the stages of an econometric model construction. Provide a detailed description of the model verification.
6	Methods of forecasting the time-series and the forecast error estimation methods.
7	Volatility estimation - parametric and non-parametric approach.
8	Systematic risk: modeling of stocks' beta.
9	Short-rate models in modelling interest rates (the main assumptions and properties of such models).
10	Martingale pricing rule. Existence of a risk-neutral (martingale) measure. Completeness of market and risk-neutral measures.
11	Value at Risk - definition and methods for its calculation..
12	Explain the difference between spot interest rates and forward interest rates.
13	Explain what are the equilibrium prices in a simple consumer exchange model and how they can be found. What are the properties of equilibrium prices? What is the dynamic process of equilibrium price formation?
14	Risk of the portfolio in the Markowitz theory and Capital Asset Pricing Model.

15	Weighted Average Cost of Capital (WACC): definition, components and areas of implementation.
16	Explain what is efficient market hypothesis and provide examples of phenomena that make financial markets inefficient.
17	Elaborate on the general structure of the financial markets taking into consideration the type of the instrument, market access, and trading participants.
18	Measuring default risk – methods.
19	Describe briefly life and non-life insurances.
20	List factors that affect stock option prices. Explain relationship between option price and listed factors.
21	Property, plant, and equipment. Characteristics, measurement, and presentation in the statement of financial position.
22	Identify the main goals of the financial analysis and discuss the subsequent stages in the process of carrying out the financial analysis.
23	Describe the models that are used by central banks to estimate the term structure of interest rates.
24	Referring to the Mundell - Fleming model of an open economy explain what are the results of increase in government spending and due to which transmission mechanisms these results happen.
25	Characterize the role of elements of financial statement (statement of financial position, statement of comprehensive income, statement of cash flows).