MASTER'S DEGREE EXAMINATION
Study major: Economics

1. Define rational preferences. Do you know any examples of preferences that are not rational?
2. Utility as a preference representation. Refer to axioms on preference relation and Debreu theorem.
3. Utility maximisation problem. Present the structure of the problem and its solution.
4. Indirect utility function: definition and applications.
5. Substitution and income effect of changes in commodity prices. Slutsky equation.
6. Expenditure minimisation problem and Hicksian (compensated) demand.
7. Law of compensated demand.
8. Normal vs Giffen good. Compare using income and substitution effects.
9. Revealed preferences. Axioms and applications.
10. Aggregate demand and representative consumer.
11. Von Neumann-Morgenstern expected utility theory. Key axiom and its consequences.
12. Measures of risk aversion.
13. Measures of riskiness and stochastic dominance.
14. Paradoxes of expected utility. Discuss them in the context of the independence axiom.
15. Subjective probabilities and subjective expected utility.
16. Decision making under uncertainty / ambiguity.
17. Expected utility vs. the prospect theory.
18. Objectives of the firm and profit maximization problem.
19. Define the cost function in producer's theory and discuss its properties.
20. Shephard Lemma and its applications.
21. The concept of economies of scale.
22. Aggregate production. Existence of the representative firm.
23. Efficient production. Define and interpret.
24. Pareto optimality. Definition and characteristics.
25. Characterise Pareto optimal allocations using the first order conditions.
26. Pareto optimal allocations vs. solutions to social welfare function maximization problem.
27. Walrasian equilibrium of a production economy. Definition and interpretation.
28. Characterise the Walrasian equilibrium using the first order conditions.
29. First and second welfare theorem. Assumptions, statement and implications.
30. Money demand models: money in the utility.
31. Economic growth according to the Solow-Swan model.
32. Macroeconomic consequences of dynamic inconsistency of macroeconomic policies.
33. Optimal consumption-savings decisions in the Ramsey-Cass-Koopmans model.
34. The role of savings in models of economic growth.
35. Fiscal policy in the Ramsey-Cass-Koopmans model.
36. Define steady state and balanced growth path in macroeconomic models.
37. Models of endogenous economic growth.
38. Comparison of endogenous and exogenous growth models.
39. Overlapping generations models and their application to analysis of macroeconomic policies.

40. Stylized facts about business cycle fluctuations.
41. Discussion about Ricardian equivalence.
42. The role of discounting in economic models with intertemporal optimisation.
43. Distortionary and neutral taxation.
44. Macroeconomic consequences of nominal price and wage rigidity.
45. Transversality condition in macroeconomic models.
46. Models of consumption and income allocation in the life cycle at the micro and macro levels.
47. Money demand models: cash-in-advance.
48. Effects of technology shocks in the real business cycle and New Keynesian models.
49. Hypothesis of unconditional convergence vs. hypothesis of conditional convergence.
50. Costs of stable and variable inflation.
51. Investment demand models with adjustment costs.
52. Money-based business cycle theory: efficiency of expansionary monetary policy.
53. The importance of the random walk hypothesis in the consumption theory.
54. Microeconomic determinants of price and wage rigidity.
55. Efficiency of equilibrium in the real business cycle and New Keynesian models and its implications for economic policy.
56. Unemployment as an equilibrium outcome in efficiency wages model.
57. Phillips curve augumented by expectations.
58. Effective lower bound on the nominal interest rates.
59. Application of dynamic optimization methods in economic models.
60. Stylized facts about economic growth.
61. What determines the variance of the least squares estimator?
62. What does it mean that explanatory variable is endogenous. Discuss the most common cases of endogeneity. What are consequences for the least square estimator?
63. What does it mean that explanatory variables are colinear? Discuss consequences of this problem for the least square estimator?
64. Explain the instrumental variable estimation. Discuss the main requirements for instrumental variables.
65. What is spurious regression. Describe its consequences for the least square estimation.
66. Explain the concept of cointegration. Discuss the nature of the error correction mechanism.
67. Discuss the similarities and differences between random effect and fixed effect model.
68. Explain the nature and causes of heteroskedastic error term. What are consequences for the least square estimator.
69. Explain stationarity. How it can be tested empirically?
70. Discuss essential assumptions and key properties of the least squares estimator.
71. Explain how to test various empirical economic hypotheses (both simple and complex, both linear and non-linear).
72. Explain the difference-in-difference method.
73. Explain the dynamic panel data model bias and discuss the most popular estimators for dynamic models (i.e., Anderson-Hsiao, Arellano-Bond).
74. Discuss the logit model for binary and multinomial dependent variable.

75. Discuss VAR (Vector Autoregression) and structural VAR models.
76. Discuss the estimation method for the SEM models.
77. Explain the nature of count data and discuss models for count data.
78. Discuss the problem of identification in the SEM (Simultaneous Equations Model).
79. Explain the nature and causes of serially correlated residuals. What are consequences for the least square estimator?
80. Discuss the issue of censored data and explain tobit regression.
81. Methods of finding the local maximum in dynamic problems with discrete time.
82. Formulation and application of the backward induction method in inter-period optimisation.
83. Bellman's principle of optimality: definition and applications.
84. Compactness of sets and continuity of functions vs. existence of solutions of optimisation problems.
85. Methods of solving dynamic optimisation problems with a finite and infinite planning horizon.
86. Solving static optimization problems with equality constraints: the Lagrange method.
87. Solving static optimization problems with inequality constraints: the Karush-Kuhn-Tucker theorem.
88. Existence of fixed points: Banach's contraction mapping theorem.
89. First and second order conditions in static optimization problems.
90. Steady state of a dynamic system: definition and applications.
91. Phase diagram of a dynamic system: definition and applications.
92. Implicit function theorem and its applications.
93. Value function and policy function in solving dynamic optimization problems.
94. The concept of time consistency and its role in dynamic optimization problems.
95. Bellman equation: definition and applications.
96. Interior and corner solutions in static optimization problems with inequality constraints.
97. Methods of proving existence of a solution in optimization problems.
98. Closedness, boundedness, compactness and convexity of sets.
99. Compactness of sets in finite and infinite dimensional spaces.
100. Axioms of norm and distance function (metric).

Literature:

1. A. de la Fuente (2000), Mathematical Methods and Models for Economists, Cambridge University Press;
2. K. Sydseater, P. Hammond, A. Seierstad, A. Strom, Further mathematics for economic analysis, Prentice Hall, 2008;
3. Gruszczyński M., T. Kuszewski, M. Podgórska (red.), Ekonometria i badania operacyjne, Wydawnictwo Naukowe PWN, Warszawa;
4. Hall R. C., Griffiths W. E., Lim G. C., Principles of Econometrics, Wiley;
5. Pesaran M. H., Time Series and Panel Data Econometrics, Oxford University Press;
6. Wooldridge J. M., Econometric Analysis of Cross Section and Panel Data, the MIT Press;
7. Wooldridge J. M., Introductory Econometrics: A Modern Approach, Cengage Learning;

8. Mas-Colell, A., M. D. Whinston, and J. R. Green (1995): Microeconomic theory. Oxford University Press;
9. Kreps, D. M. (2012): Microeconomic Foundations I: Choice and Competitive Markets. Princeton Uni-versity Press;
10. Jehle, G. A., and P. J. Reny (2011): Advanced Microeconomic Theory. Prentice Hall;
11. Rubinstein, A. (2006): Lecture Notes in Microeconomic Theory: The Economic Agent. Princeton;
12. Wickens, M. (2008): Macroeconomic Theory. A Dynamic General Equilibrium Approach. Princeton University Press;
13. Ljungqvist, L., and T. Sargent (2005): Recursive macroeconomic theory. The MIT Press, 2 edn.;
14. Romer, D. (2005): Advanced Macroeconomics. McGraw-Hill/Irwin, 3rd edn.;
15. Stokey, N., R. Lucas, and E. Prescott (1989): Recursive methods in economic dynamics. Harward University;
16. Walsh, C. (2010): Monetary theory and policy. The MIT Press.