

TOPICS FOR THE DIPLOMA EXAM
MANAGEMENT AND PRODUCTION ENGINEERING
second-cycle studies

1. Characteristics of the Balanced Scorecard in strategic management
2. PEST method
3. Strategic Balance
4. Classification of production processes
5. Lean manufacturing methods and techniques: characteristics, purpose, advantages/disadvantages
6. Balancing of production processes: methods/algorithms, characteristic indicators
7. Functional modules of the SAP ERP system (HANA)
8. The sales process in the SAP system
9. Application of the credit control system in SAP
10. Quantitative and qualitative forecasting methods
11. Basic measures of the forecasts accuracy in the enterprise
12. Heuristic methods of forecasting in the enterprise
13. Principles of project and innovation management
14. Risk management principles in decision-making
15. Decision-making criteria under conditions of uncertainty
16. Network methods in decision support
17. Decision trees
18. Coalition rules
19. Types of control instructions and their use in programming
20. The idea of using objects in programming
21. Similarities and differences in providing services and manufacturing products
22. The break-even point
23. Concurrent engineering principles
24. Pareto-ABC method
25. FMEA analysis
26. Reliability measures, bathtub curve
27. Product life cycle
28. The method of scheduling weighted factors in multi-criteria optimization
29. The CPM method in the arrangement of objects
30. The method of position scales in balancing the production line
31. Quality control cards
32. Principles of MRP (material requirements planning)
33. Research process (aim, problem, hypothesis, variables, indicators)
34. Protection of intellectual property in scientific research

specialty: **LOGISTICS MANAGEMENT**

35. Methods of stock control
36. Methods of determining the size of the production lot
37. Types of supply chains and basic decisions made in the supply chain
38. The role of information and information systems in the management of distribution logistics and the supply chain
39. Areas of application of computer simulation of production processes
40. Data required to build a simulation model of a production system
41. Stages of building a simulation model of a production system
42. Lean manufacturing concept
43. Constrains management concept
44. Stages of the knowledge management process
45. Methods of acquiring knowledge
46. Knowledge map characteristics
47. Electrical methods in the measuring linear displacements, force and pressure
48. The concepts of error and uncertainty of measurement, and the method of their calculation
49. Definition and classification of measurement systems
50. Advantages and disadvantages of centralized procurement
51. Tasks and structure of the MRP system

specialty: **PRODUCTION AND SERVICE MANAGEMENT**

35. Types of wastage, 5W1H method in locating wastage
36. General scheme for examining working methods, process cards
37. Basic work measurement methods (MTM, timing,
38. Fundamentals of Optimized Production Technology (OPT)
39. OEE and OLE metrics
40. Methods of optimal arrangement of workstations
41. Algorithms for scheduling operations in job/flow shops
42. General scheme of modeling production processes
43. Characteristics of the most commonly used ESP modeling methods
44. Basic problems of the Petri nets, the incidents matrix
45. Application of CAD 3D programs in marketing
46. Application of CAD / CAE systems in structural analysis
47. Reverse engineering technique
48. Design for assembly: purpose, scope, methodology
49. The main reasons for introducing the production processes restructuring
50. Methods used in production scheduling
51. The production schedule and the course of the production process
52. Enterprise know-how

specialty: **QUALITY ENGINEERING**

35. The use of multivariable cards in assessing the process stability. List two multivariable cards: one to assess the level of centering, the other to assess the process spread.
36. Sampling rules based on single-sampling plans. What is AQL?
37. Characteristics of a two-factor experiment. The purpose of the experiment, the experimental plan and the result analysis method
38. Regression analysis. Purpose and basic assumptions of the analysis, the significance of the least squares method
39. Method of constructing two-level factorial designs: full and fractional
40. Application areas in computer simulation of production processes
41. Data required to build a simulation model of a production system
42. Stages of building a simulation model of a production system
43. Reverse engineering (RE) characteristics
44. Characteristics of 3D modelling methods. Advantages and disadvantages
45. Fault Tree Analysis (FTA)
46. QFD analysis
47. Scanning microscopy and X-ray microanalysis in assessing the quality of materials and products
48. Welding imperfections and quality assessment of welded joints
49. Basic quality assurance tools in the production process (visualization, standardization, testing, Poka Yoke)
50. Systemic approach to quality management on the example of Toyota Production System
51. Characteristics of exemplary quality management tools and techniques used in Smart Factory (e.g. Big Data analyses, 3D scanners, programs for simulation and prediction of production processes)