Intermediate examination

on discipline “Machine Shops Design”

for students majoring in the speciality 150700

«Mechanical Engineering»

Progress assessment

The following materials refer to the course “Machine Shops Design” and are to be used for progress assessment.

1. What are the ways of manufacturing essentially novel products?
2. What are the main stages of production?
3. What is flow-line production?
4. What is non-line production?
5. What is a production cycle?
6. What is a batch?
7. What is a production floor?
8. What is a workshop?
9. What is the total area of a workshop?
10. What is direct labour?
11. What is auxiliary labour?
12. What are the engineering and technical personnel?
13. What are the office personnel?
14. What is junior labour?
15. What is the difference between shop arrangement and shop layout?
16. What is goods traffic intensity?
17. What is ‘column space’ and ‘width of span’?
18. What is a column grid?
19. What does the basic section of the machine shop design contain?
20. What does the special section of the machine shop design contain?
21. Enumerate the sequence of designing machine shops.

22. What problems should be solved when designing machine shops?

23. What are the raw data for a machine shops design when building a new shop and modernizing an existing one?

24. Enumerate the tasks which are solved at pre-design stage.

25. What are the main sections of the machine shop design?

26. What are the basic requirements to the workplace?

27. What does working design documentation include?

28. What does the technical design assignment include?

29. What problems are solved by a CAD system when designing divisions and shops?

30. What principles is it necessary to adhere when designing shops?

31. Describe how to determine a type of production.

32. Describe each type of production.

33. What are the ways to automate manufacture?

34. What is a Flexible Manufacturing System (FMS)?

35. What is a Robotized Technological Complex (RTC)?

36. What is a Flexible Manufacturing Module (FMM)?

37. What is a flexible transfer line?

38. What is a flexible manufacturing cell?

39. What is a flexible automated workshop?

40. What is a flexible manufacturing automated factory?

41. What is a production supporting system? What does it contain?

42. Draw a production efficiency graph depending on manufacturing automation. Specify the type of the equipment used.

43. Enumerate the factors limiting the specialization.

44. What are the main criteria of choosing the equipment configuration?

45. Enumerate constructive and technological measures in order to increase flexibility of production.

46. Enumerate construction and installation measures in order to increase flexibility of production.

47. Enumerate raw data for shop reconstruction.

48. Enumerate stages of calculating labour input of machining annual programme for all parts in the shop when designing a shop for small-scale production.

49. What is plant schedule?

50. What is an actual plant schedule?

51. Describe how to calculate floor-to-floor time for one operation (process)?

52. Describe how to calculate total floor-to-floor time for operation (process)?

53. What does the batch size influence on?

54. Describe how to calculate the batch size.

55. What is the machine-setting time? What does it consists of?

56. Describe how to calculate the demanded amount of one type (j-type) of the machine tools in the shop.

57. What is technological process synchronization? What ways of it are there?

58. Describe the methods of an equipment layout.

59. What factors are taken into account when designing a shop layout?

60. What elements are shown in the shop layout drawing?

61. What does workplace organization depend on?

62. Describe the methods of arranging the equipment relative to the aisle way.

63. Describe the methods of grouping the equipment in the shop.

64. What does the production floor space consist of?

65. Describe how to calculate the total production floor space of the shop.

66. Describe how to calculate the total floor space of the shop.

67. Describe how to calculate the employment size in the shop.

68. What does the auxiliary system consist of?

69. Describe the types of storehouses according to their intended purpose.

70. Describe the types of storehouses according to the form of storing.

71. Describe the types of storehouses according to the level of mechanization.

72. Describe the types of the transport service according to their intended purpose.

73. Describe how to reduce the volume of goods traffic in the shop.

74. How is the volume of goods traffic shown in the shop layout?

75. What functions does the tool management service perform?

76. What is the structure of the tool management service?

77. What functions does the repair and maintenance service perform?

78. What is the structure of the repair and maintenance service?

79. Describe how to calculate labour input of annual maintenance of all machine tools in the shop.

80. How does a chip removal system work?

81. What functions does the quality inspection service perform?

82. What is the structure of the quality inspection service?

83. What functions does the consumer service and labour safety service perform?

84. What is the structure of the consumer service and labour safety service?

85. What functions does the production preparation and management service perform?

86. What is the structure of the production preparation and management service?

87. What basic tasks are assigned to a shop management system?

88. What is enterprise resource planning (ERP)? What is it intended for and what limitations are there?

89. What is manufacturing resources planning (MRP)? What is it intended for and what limitations are there?

90. What configurations and types of shop buildings are there? What are they intended for and what limitations are there?

91. What are the main principles influencing on the choice of a shop arrangement?

92. What are the basic technical-and-economic indexes characterizing the general work programme of the factory?

93. What do project engineers give as an assignment for project development of dimensioning specifications?

94. When is antivibration mounting used?

95. What parts does the sanitary-engineering section of the project include?

96. What does the heating and ventilation design section include?

97. What does the heat and power design section include?

98. What does the electric power design section include?

99. Describe how to calculate the shop cost price to manufacture products?

100. What indexes are used for estimating the project quality?

101. Specify the structure of the mechanical production design.

102. Enumerate advanced types of the equipment for the basic types of manufacturing.

103. What is the reduction coefficient? Describe how to determine it.

104. Describe how to calculate the required amount of machine tools.

105. Describe how to calculate labour input according to the resulted program.

106. Describe the basic types of shops arrangement, their advantages and disadvantages.

107. Describe time arrangement of the equipment.

108. Describe time arrangement of the workforce.

109. What is the structure of the flexible manufacturing system?

110. Describe how to calculate production floor space.

111. Describe how to choose a conveyor type suitable for flow-line production.

112. Enumerate the measures for increasing manufacture flexibility.

113. Describe the variants of arranging the equipment, their advantages and disadvantages.

114. What is the structure of the tool management service?

115. Describe how to calculate the total area of the shop.

116. Describe the storehouse service, its classification and objectives.

117. Describe the methods of performing a layout, their advantages and disadvantages.

118. Enumerate the measures for increasing production unification and specialization.

119. Enumerate the basic design stages.

120. Describe the basic requirements to a workplace of the assembly fitter.

121. Describe the basic requirements to a workplace of the milling machine operator.

122. Describe the problems solved when designing machine-assembly shops.

123. What are the basic stages of the pre-design period?

124. Specify the structure of the technical design assignment for constructing new manufacture and reconstructing the existing one.

125. Describe functions of repair service and maintenance service.

126. What functions does tool system perform?

127. Describe how to calculate the auxiliary area of the shop.

128. Describe transport service, its classification and functions.

129. Describe methods of performing a layout, their advantages and disadvantages.

130. Enumerate the basic stages of production.

131. What are the basic requirements to the workplace of a lathe operator?

132. What is the reduction factor and how to determine it?

133. Describe how to calculate the quantity of machine tools.

134. Describe how to calculate labour input according to the resulted program.

135. What are the main types of shop arrangement, their advantages and disadvantages?

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