

**Пререлік теоретичних питань для проведення  
модульної контрольної роботи**

**ННАКІ**  
**Кафедра**  
**Машинознавства**

ЗАТВЕРДЖУЮ  
Зав.кафедри \_\_\_\_\_ (Кіндрачук М.В.)  
(підпис) (ПІБ)  
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**МОДУЛЬНА КОНТРОЛЬНА РОБОТА №1 з  
дисципліни «Механіка»**

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1. Construct diagrams of  $N$  and  $\sigma$  and check the strength of the bar, which is fixed by the top end.
2.  $P_1 = 18 \text{ kN}$ ;  $P_2 = 11 \text{ kN}$ ;  $P_3 = 21 \text{ kN}$ ;  $F = 1,5 \text{ sm}^2$ ;  $[\sigma] = 160 \text{ MPa}$ .
3. Construct diagrams  $Q$  and  $M_b$  defining the reactions of the beam seats.
4. Determine the degree of freedom and carry out structural analysis of the mechanism.
5. To analyze rule of signs on bending.
6. To analyze rule of signs on torsion.
7. To analyze rule of signs on tension (compression).
8. To define strain (deformation)/
9. To estimate how can we mark movable hinged beam seat and unmovable hinged beam seat.
10. To define the order of diagram  $Q$  and  $M_b$  construction for the bending of console.
11. To define the order of diagram  $Q$  and  $M_b$  construction for the bending of a beam on two hinged seats.
12. To analyze the order of the circular cross section bar torsion diagram construction.
13. To analyze the order of tension (compression) diagram construction.
14. To estimate elastic and residual strain (plastic).
15. To analyze the types of simple deformations.
16. To define the method of sections
17. To define what is the Strength of Materials.
18. To analyze stress-strain diagram
19. To define the main hypothesis of "Strength of Materials"
20. Criteria of serviceability of machine elements. Main conditions for strength.
21. Determining allowable stresses.
22. Transmissions. Classification. Basic parameters of transmissions.
23. Gearing. Advantages. Classification.
24. Straight spur gears. Geometry and basic geometrical parameters.
25. Straight spur gears. Force analysis. Materials.
26. Main failures of gears.
27. Calculation of straight spur gears for contact strength.
28. Calculation of straight spur gears for bending strength.
29. Compound gear trains. Classification. Determination of the velocity ratio.
30. Shaft and axles. Definitions. Classification. Materials
31. Determination of the shaft minimal diameter. Designing the shaft construction.
32. Strength analysis of shafts.
33. Bearings. Advantages of rolling contact bearings. Classification.
34. Rolling contact bearings. Main failures. Calculation of rolling contact bearings
35. Threaded joints. Classification of threads. Geometry.
36. Analysis of threaded joints for strength.
37. Threaded joints. Friction in threads. Locking threaded joints.