

Topics for Final Exam (Engine and Vehicle Structures)

1. Classification, structural design, and working principles of internal combustion engines.
2. Working cycles of Otto and Diesel engines, comparison of Internal and External combustion engines.
3. Properties and production of fuels used in engines.
4. Fuel supply systems of internal combustion engines.
5. Exhaust systems of internal combustion engines, reduction of harmful emissions.
6. Lubrication and cooling of internal combustion engines.
7. Electrical systems of internal combustion engines.
8. Internal combustion engine operation, indicator diagrams.
9. Torque and power characteristics of internal combustion engines, characteristic speed curves.
10. Typical dimension of an engine, and measurements of its properties.
11. Structural properties and operating principles of jet engines and radial flow turbine engines.
12. Major legislation in the automotive industry. Concepts and general description of vehicles.
13. Mechanical transmission systems for vehicles.
14. Hydraulic transmission systems for vehicles.
15. Steering modes and steering mechanisms of vehicles.
16. Vehicle running gear (running gear solutions), tires.
17. Starting of a vehicle.
18. Braking systems of vehicles.
19. Vehicle dynamics, safe driving.
20. Vehicle undercarriage, chassis.
21. Active passenger safety system of vehicles.
22. Passive passenger safety system of vehicles.
23. Special vehicles (tricycles, locomotives/trains, tracked vehicles).
24. Hybrid and electric vehicles.
25. Vehicle trailers, tractor-trailer design.
26. Theoretical background of lubrication systems used in vehicles and engines, wearing processes.