Questions to prepare for the exam of " Physics of energy processes "

Part № 1

1. Conventional and non-conventional sources of energy.
2. Efficiency evaluation of conventional sources of energy.
3. The main relations of mechanics of liquid and gas.
4. Application of thermodynamics laws.
5. Estimated calculation of the system of heat transfer.
6. Physical bases of the transformation processes of solar energy.
7. Calculation of thermal insulation systems by the method of thermal circuit.
8. Processes of solar rays absorption in materials.
9. Problems on calculation of solar exposition.
10. Geothermal sources of energy.
11. Thermal storage of energy.
12. Thermal solar systems for gettig a cold, for heating of the room and air drying.
13. Using of solar radiation for prepearing food and fresh water
14. Systems of solar heat supply.
15. Transformation of thermal solar energy into mechanical and chemical energy.

Part № 2

16. Stirling Engines.
17. Solar power station of tower type and with dispersed collecters.
18. Photoelectric properties of p-n junction.
19. Electronic properties of semiconductor materials.
20. Transformation of thermal solar energy into electric energy with semiconductor converters.
21. Physical properties and characteristics of semicunductors.
22. Energetical constituents of solar radiation, evaluation of solar exposition.
23. Constructons and materials of solar elements.
24. Spectral characteristics of solar radiation.
25. Basic principles of cistern using and examples of energetical systems with their using.
26. Using of cistern and wind energy.
27. Wind energy and opportunities of its using.
28. Problems of wind energetic in Kazakhstan.
29. Production of wind energy, classification of wind turbine.
30. Examples of energetic systems using cistern.

Part № 3

31. Transformation of thermal solar energy into mechanical energy.
32. Theory of ideal wind turbine.
33. Principles of work and parameters of vertical and orthogonal wind turbines, turbines of frontal resistence.
34. Transformation of thermal solar energy into electrical energy
35. Installations, using wind and rush energy. Examples of using installations of various type.
36. Examples of energetic systems using wind and rush energy.
37. Transformation of thermal solar energy into chemical energy.
38. Principles of energetic devices based on photosynthesis and biofuels, exotic transformations of solar energy.

39. Thermal mode of Earth's crust.
40. Sources of geothermal heat.
41. Energy storage.
42. Chemical and biological storage.
43. Storage of heat and electroenergy.
44. Fuel elements and mechanical storage.
45. Using of air mass energy, map and force of winds in different areas of earth.