Questions to prepare for the exam
Of "Physics and technology of energy saving and renewable energy"

Part (Блок) № 1

1. The absorption of sunlight in the materials
2. The method for calculating the thermal circuit temperature conditions of heat detectors
3. The method for calculating the thermal circuit temperature regimes receivers of radiant energy
4. The photoelectric effect - a quantum phenomenon
5. photoelectric Effects
6. The spectral characteristics of solar radiation.
7. Energy components of solar radiation , solar exposure assessment .
8. Geothermal energy.
9. The physical principles of solar thermal energy converters .
10. Conversion of solar thermal energy into mechanical energy.
11. Conversion of solar energy into thermal energy.
12. Conversion of solar thermal energy into chemical energy.
13. Physical properties and characteristics of semiconductors.
14. Semiconductor photodetectors.
15. Characteristics of solar cells.
16. Work of gas at isochoric process.
17. The amount of heat and work in an isothermal process

Part (Блок) №2

18. Use of water resources and wind energy.
19. Principles of energy devices based on photosynthesis.
20. Principles of power devices based on biofuels
21. Features and biofuels.
22. Ecological problems of non-conventional energy sources.
23. Environmental problems of the use of renewable energy sources.
24. The use of biofuels for energy purposes.
25. Thermochemical processes.
26. Reflection and refraction of light at the interface between air and the conductive medium.
27. Photovoltaic effects in thin and thick p-n junction.
28. Physical features of the contacts metal - semiconductor and heterojunction.
29. Direct conversion of heat energy.
30. Using the energy of ocean currents.
31. Types of power plants based on the use of ocean currents.
32. Power of the tidal currents and tidal water rise.

33. The first law of thermodynamics (the law of conservation of energy for thermal processes)
34. Isobaric process: the internal energy and the work of the commission.

Part (Блок) №3

35. Surface wave energy converters .
36. Tidal energy converters upgrades of water.
37. Heat high thermal water.
38. Features of use of highly mineralized water sources.
39. Thermal regime of the Earth's crust.
40. Energy use of air masses , map and strength of the winds in different regions of the globe .
41. Loss of wind turbines . The theory of the real wind turbine .
42. The classical theory of an ideal wind turbine .
43. Classification of wind turbines on the principle of operation.
44. Classification of heat accumulators . Pumping and heat exchange envoirenment.
45. Solar collectors.
46. Concentrating solar collector.
47. Structures and materials of solar cells.
48. The problem of the interaction energy and the environment.
49. Environmental Effects of Tidal Energy.
50. Adiabatic process in gases.
51. Efficiency of the heat engine.