1	Which interactions relate to fundamental?	№1
2	List the fundamental interactions in ascending order of the relative intensity.	№1
3	What is the gravitational waves and what are the possible sources of their nature?	№1
4	In whichphysical phenomena is weak interactions occur?	№1
5	Why weak interactionsareconsideredas short-action?	№1
6	At what values of the interaction energy can we talk about merger of weak and electromagnetic interactions?	№1
7	Pions and gluons are two kinds of quanta in the strong interaction.	№1
8	Why neutrinos are an important source of information on thermonuclear processes inside the Sun and stars?	№1
9	Howcanregisterneutrinos?	№1
10	Whatisneutrinooscillations?	№1
11	What changes have been the concept of "rest mass" and "relativistic mass" in recent developments in particle physics?	№1
12	What is meant by the terms "technology" and "quantum" sensitivity limits in the physical experiment?	№1
13	"Colored" and "colorless" particles.	№1
14	What is the cumulative particle?	№1
15	What is the concept of "mass defect" and how they define the "valley of stability"?	№1
16	What four groups divided presently known radioactive processes?	№1
17	How the model of "liquid drop" explains nuclear fission?	№1
18	Which nuclei characterized proton and double-proton radioactivity?	№1
19	What is a cluster radioactivity?	№1
20	How beams of accelerated radioactive nuclei are used to obtain and study of exotic isotopes?	№1
21	Specify the main features and characteristics of the interactions of charged particles.	№2
22	Specify the main features of the strong interaction.	№2
23	Describe the basic characteristics of the weak interaction.	№2
24	How to call the particles or field which creates interaction?	№2
25	How to call the particles that are elementary components of matter?	№2
26	What does mean quantum number "color" for quarks?	№2
27	What is the difference of "gluons" and quarks?	№2
28	What means and describe Feynman diagrams?	№2
29	Planck's constant - quantum of what quantity in physics?	№2

30	What is the physical meaning of indeterminacy?	№2
31	What an important role plays weak interaction in the formation of our Universe?	№2
32	Why do we need high-energy particle accelerators? Why they can be used to understand the physics of the early Universe?	№2
33	What is the Large Hadron Collider?	№2
34	What is a cyclotron? Describe the basic principles of its operation.	№2
35	Yukawa potential and the Coulomb potential - describe their main characteristics and differences.	№2
36	Leptons. Give the types of leptons and their characteristics.	№2
37	Spinsofelementaryparticles.	№2
38	Pauli principle and structure of nuclei. Describe the construction of the electron orbits in atoms.	№2
39	FermiandBoseparticles.	№2
40	What are the properties of particles associated with quantum number "strangeness"?	№2
41	The binding energy of the nuclei.	№3
42	How to determine the binding energy of the nucleus, knowing the mass of the nucleus, the mass of the proton and neutron?	№3
43	Find a specific energy of a nucleus of a helium atom.	№3
44	Determine the total binding energy of a nucleus of uranium-238.	№3
45	Determine the total specific binding energyof a nucleus of molybdenum- 96.	№3
46	Determine the total binding energy of a nucleus of osmium -191.	№3
47	Describe the types of radioactivity of different nuclei.	№3
48	Describe the reaction of the alpha decay of nuclei.	№3
49	Describe the reaction of the beta decay of nuclei.	№3
50	Reaction of electron capture.	№3
51	Gamma and beta radiation of nuclei.	№3
52	The reaction of spontaneous fission of heavy nuclei. Describe the fission products.	№3
53	Principle of operation of nuclear reactors based on uranium fission.	№3
54	Fission chain reaction.	№3
55	The reaction of light nuclei. Write the fusion reaction of protons with form of deuterium nuclei.	№3
56	Burning the nuclei of hydrogen atoms on the Sun.	№3
57	Cycles of thermonuclear burning of hydrogen with form of helium nuclei.	№3
58	Which means "island of stability" for the nuclei of chemical elements?	№3

59	Properties of nuclei far from island of stability. Give examples.	№3
60	Abundances of chemical elements in nature.	№3