

| | | | |
|----|---|----|------------------------|
| 1 | Describe the space-time symmetry. Write the main relations. | №1 | |
| 2 | Give definition and describe bosons and fermions. Which have an integer-valued spin? | №1 | |
| 3 | Give definition and describe bosons and fermions. Which have a half-integer spin? | №1 | |
| 4 | Explain the meaning of super-partner. | №1 | |
| 5 | Characterize quantum numbers and a mass of selectron. | №1 | |
| 6 | Explain the meaning of broken symmetry and spontaneously broken symmetry. | №1 | |
| 7 | Give definition and describe antimatter and the numbers of particles. | №1 | |
| 8 | Write the uncertainly principle in quantum mechanics. | №1 | |
| 9 | Describe the Standard Model of particle physics. | №1 | |
| 10 | Explain the unification of three forces which are actually made by supersymmetry. | №1 | |
| 11 | Explain the meaning of Tevatron collider. | №1 | |
| 12 | Explain the meaning of Large Hadron Collider. | №1 | |
| 13 | Explain an experimental evidence of Dark Matter. | №1 | |
| 14 | Explain spontaneously broken symmetry and superpartners may differ in mass – explain these using the hierarchy problem. | №1 | |
| 15 | Describe Higgs boson | №1 | |
| 16 | Analyze Lie algebra and Lie superalgebra – basic concepts | №2 | |
| 17 | Analyze Poincare algebra and Super Poincare algebra – main positions Analyze | №2 | |
| 18 | Describe Pauli matrices | №2 | |
| 19 | Explain Minimal Supersymmetric Standard Model (MSSM) | №2 | |
| 20 | Describe Standard Model | №2 | |
| 21 | Characterize mass renormalization | №2 | |
| 22 | Give definition and describe fermionic top quark | №2 | |
| 23 | Give definition and describe Feynman diagrams | №2 | |
| 24 | Explain weakly interacting massive particle (WIMP) | №2 | |
| 25 | Describe Neutralino – heavy stable particle | №2 | |
| 26 | Give definition and describe soft SUSY breaking | №2 | 02.11.201. 15:07:47 |
| 27 | Give definition and describe supersymmetric dark matter and R-parity | №2 | 02.11.201. 15:07:58 |
| 28 | Give definition and describe Abelian field strength superfield | №2 | 02.11.201. 15:12:04 |

| | | |
|----|--|-----|
| 29 | Give definition and describe vector superfields | Nº2 |
| 30 | Describe properties of the Lorentz group | Nº2 |
| 31 | Explain chiral superfields | Nº3 |
| 32 | Give definition and transformation of the vector superfield | Nº3 |
| 33 | Explain Wess Zumino gauge | Nº3 |
| 34 | Analyze generators of $SL(2, C)$ | Nº3 |
| 35 | Describe products of Weyl spinors | Nº3 |
| 36 | Give definition and describe massless supermultiplet | Nº3 |
| 37 | Describe algebra of extended supersymmetry | Nº3 |
| 38 | Characterize basics about superspace | Nº3 |
| 39 | Give definition and describe four dimensional supersymmetric Lagrangians | Nº3 |
| 40 | Describe non-renormalization theorems | Nº3 |
| 41 | Describe supersymmetry breaking | Nº3 |
| 42 | Give definition and describe the MSSM - basic ingredients | Nº3 |
| 43 | Give definition and describe the MSSM : Particles | Nº3 |
| 44 | Give definition and describe the MSSM: Interactions | Nº3 |
| 45 | Describe supersymmetry breaking in the MSSM | Nº3 |