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| 1 | What is the space-time symmetry? Write the main relations. |
| 2 | What are bosons and fermions? Which have an integer-valued spin? |
| 3 | Which have a half-integer spin? Bosons or fermions? |
| 4 | What does mean super-partner? |
| 5 | What are quantum numbers of selectron, and  what is a mass of selectron? |
| 6 | What does mean broken symmetry and spontaneously broken symmetry? |
| 7 | What is antimatter and what are the numbers of particles? |
| 8 | Write the uncertainly principle in quantum mechanics. |
| 9 | What is the Standard Model of particle physics? |
| 10 | Supersymmetry actually makes the unification of three forces: explain what are these forces? |
| 11 | What does mean Tevatron collider? |
| 12 | What does mean Large Hadron Collider? |
| 13 | How do you explain experimental evidence Dark Matter? |
| 14 | Spontaneously broken symmetry and superpartners may differ in mass – explain these using the hierarchy problem. |
| 15 | Higgs boson |
| 16 | Lie algebra and Lie superalgebra – basic concepts |
| 17 | Poincare algebra and Super Poincare algebra – main positions |
| 18 | Pauli matrices |
| 19 | Minimal Supersymmetric Standard Model (MSSM) |
| 20 | Standard Model |
| 21 | Mass renormalization |
| 22 | Fermionic top quark |
| 23 | Feynman diagrams |
| 24 | Weakly interacting massive particle (WIMP) |
| 25 | Neutralino – heavy stable particle |
| 26 | Soft SUSY breaking |
| 27 | Supersymmetric dark matter and R-parity |
| 28 | Abelian field strength superfield |
| 29 | Vector superfields |
| 30 | Properties of the Lorentz group |
| 31 | Chiral superfields |
| 32 | Definition and transformation of the vector superfield |
| 33 | Wess Zumino gauge |
| 34 | Generators of *SL*(2*,*C) |
| 35 | Products of Weyl spinors |
| 36 | Massless supermultiplet |
| 37 | Algebra of extended supersymmetry |
| 38 | Basics about superspace |
| 39 | Four dimensional sup ersymmetric Lagrangians |
| 40 | Non-renormalization theorems |
| 41 | Supersymmetry breaking |
| 42 | The MSSM - basic ingredients |
| 43 | The MSSM : Particles |
| 44 | The MSSM: Interactions |
| 45 | Supersymmetry breaking in the MSSM |