

## Questions for revision of Ch. 6 & 7 & 8:

- (1) How do you distinguish strong interaction and nuclear force?  
Nuclear force is sometime called “residual strong force”.
- (2) There are different decays of particles. How do you distinguish them?
- (3) For some electrically neutral bosons, the antiparticle is identical to the particle. Can you give some examples?  
For some electrically neutral bosons, the antiparticle is not identical to the particle. Can you give some examples?
- (4) Can you list the members of the leptons?
- (5) What are the quark contents of some important baryons: p, n,...?  
What are their antiparticles? How do they decay?
- (6) What are the quark contents of some important mesons:  $\pi^0$ ,  $J/\psi$ ?  
What are their antiparticles? How do they decay?
- (7) Why do we need color charge for hadrons?
- (8) List all conservation laws.
- (9) What happens when a particle meets its antiparticle? Can they annihilate when they are moving at high speed?
- (10) Are there free quarks? Is there any experimental evidence for the quark confinement?
- (11) What is the main source of the mass in proton?
- (12) Can one measure the mass of quarks?
- (13) Can you name some important accelerators? What high energy particles are used in these colliders?  
Do you know how particles are accelerated?
- (14) List some features of cosmic rays. Why people are still interested in studying cosmic rays?
- (15) Why CM energy is so important in creation of matter?
- (16) What is the maximum CM energy available for experiments in colliders?
- (17) What is net fusion reaction in the sun?
- (18) What type of neutrinos emitted from the sun?
- (19) Can you calculate the threshold energy for Davis’ detector?
- (20) Calculate the number of target particles ( $^{37}\text{Cl}$  nuclei) in Davis’ detector.
- (21) How did Davis measure the number of  $^{37}\text{Ar}$  atoms?
- (22) Is there any discrepancy between Davis’ experimental result and the theoretical prediction? What is the best explanation for this discrepancy?
- (23) Why neutrino experiments must be done underground?