Name:

Physics 2140: Example Final Exam
Real Final Date 30 April 2004

Part 1: 12 multiple choice questions on Chapters 28.9-30 worth 2.5 points each.

1. The quantum mechanical model of the hydrogen atom requires that if the orbital quantum number = 7, there will be how many permitted orbital magnetic quantum numbers allowed?

a. 6

b. 7

c. 11

d. 15

2. The wavelength of coherent ruby laser light is 688.3 nm. What energy difference exists between the upper excited state involved and the lower unexcited ground state? (h = 6.63×10^{-34} J-s, c = 3.00×10^{8} m/s, 1 eV = 1.60×10^{-19} J, and 1 nm = 10^{-9} m)

a. 1.75 eV

b. 1.81 eV

c. 1.86 eV

d. 1.94 eV

3. How big is the energy gap between bands filled with electrons in an insulator?

a. big

b. small

c. zero

d. none of the above

4. Laser light is useful because?

a. It is all at the same wavelength

b. It is all in phase

c. It has high power

d. All of the above

5. The atomic number of a given element is equivalent to which of the following?

a. proton number in the nucleus

b. neutron number in the nucleus

c. sum of the protons and neutrons in the nucleus

d. number of electrons in the outer shells

6. An element is emitting alpha, beta, and gamma radiation. Rank order them in terms of the thickness of protective shielding they will need for safety, from least to most.

a. alpha, beta and gamma

b. gamma, beta and alpha

c. beta, gamma and alpha

d. alpha, gamma and beta

7. Uranium-238 decays to Thorium-234 by emitting which of the following?

a. beta

b. alpha

c. gamma

d. positron

8. The existence of the neutrino was postulated to account for which basic conservation laws during the beta decay process?

a. conservation of energy

b. conservation of momentum

c. Both choices a and b are valid.

d. None of the above choices are valid.

9. If a self-sustained controlled fusion reaction is to operate, a condition which must be met is that the fuel material be subjected to which of the following condition(s)?

a. confined for sufficient time period

b. have sufficiently high density

c. be at sufficiently high temperature

d. All of the above choices are valid.

10. The water surrounding the fuel rods in a nuclear fission reactor serves what purpose(s)?

a. coolant

b. moderator

c. Both choices above are valid.

d. None of the choices above are valid.

11. Mesons are composed of _____ quarks and baryons are composed of _____ quarks.

a. two, two

b. two, three

c. three, two

d. three, three

12. Which of the following particles is not made of smaller particles?

a. electron

b. neutron

c. proton

d. none of the above

Part 2: 28 multiple choice questions on Chapters 15-21, 26-28.8 worth 2.5 points each.

These questions are similar to questions from the example and real hour exams and homework given during the semester.