Name: _____

Date: _____ Grade: _____

Integrated Physics & Chemistry

CHAPTER 10 TEST

Congratulations on completing this chapter! ***Answer the following questions to test your understanding of the material. When you finish, hand in your test to your teacher for a final grade. Each answer is worth 2 points.***

Fill in the blank or circle True or False

1. Cathode rays are actually streams of: _____.
   (a) electrons (b) positrons (c) neutrons (d) protons
2. Because of their mysterious nature, the mathematical symbol for the unknown mysterious rays were called _____.
3. The substances that stopped X–rays best were: _____.
   (a) bones (b) air (c) glass (d) water
4. X–rays are produced when: _____.
   (a) electromagnetic rays cross each other
   (b) moonlight shines on ice
   (c) electrons traveling at high speed are stopped by a metal target
   (d) radioactive atoms come apart
5. The one with higher frequency, shorter wavelength, more energy and greater penetrating power is: _____.
   (a) omega particles (b) infrared light (c) ultraviolet light (d) X–rays
6. Marie Curie named polonium after: _____.
   (a) her native country of Poland (c) her mother
   (b) a good friend (d) Pierre's mother
7. Atoms of the same element have the same number of _____.
8. The atomic number is always a: _____.
   (a) large number (b) fraction (c) whole number (d) decimal
9. Atomic mass and atomic number are different for all elements except _____.
10. An electron has a _____ electric charge.
11. Atomic number is the number of _____.
12. The subatomic particle that is involved in chemical reactions is the: _____.
    (a) electron (b) neutron (c) positron (d) proton

13. The atomic mass of 241 for americium shows that it has 241 protons and _____ combined.

14. Isotopes are atoms whose nuclei have the same number of protons but different number of: _____.
    (a) alpha particles (b) beta particles (c) neutrons (d) electrons

15. Pitchblende contained the radioactive elements uranium, polonium and _____.

16. The weld holding two steel pipes together can be checked by: _____.
    (a) sonar (b) echo location (c) gamma rays (d) radar

17. Beta particles are high-speed: _____.
    (a) positrons (c) electrons
    (b) electromagnetic waves (d) helium nuclei

18. Half-life is a measure of the: _____.
    (a) time for a single radioactive atom to decay
    (b) one-half the age of the earth
    (c) time for one-half of a sample of radioactive material to disintegrate
    (d) average time to put fuel in an atomic reactor

19. The americium in smoke detectors has a half-life of _____ years.

20. _____ penetrate deeper into the body than beta rays.

21. When ions resulting from gamma rays attach themselves to nearby molecules in the body causing chemical changes, a person develops _____.

22. The symbol, $_8O^{17}$, shows that the number of protons in oxygen is: _____.
    (a) nine (b) eight (c) 17 (d) 25

23. Most of the elements found in plants and animals: _____.
    (a) are radioactive
    (b) have a low atomic mass similar to that of carbon
    (c) are not stable
    (d) are isotopes of nitrogen

24. Atomic nuclei have a _____ electric charge.

25. The naturally occurring element with the highest atomic number is: _____.
    (a) hydrogen (b) iron (c) carbon (d) uranium

26. Lise Meitner realized that slow neutrons caused uranium to: _____ _____.
    (a) change into the transuranium element plutonium
    (b) change into a stable isotope of uranium
    (c) split into two roughly equal pieces
    (d) explode violently

27. Fission means to: _____.
    (a) melt (b) bubble (c) grow larger (d) split

28. The extra energy that holds a nucleus together is the: _____.
    (a) binding energy (c) electrostatic force
    (b) fission energy (d) fusion energy

29. One reason separating uranium-235 from uranium-238 is difficult is because they have the same _____ properties.

30. From 1978 to 2000, the number of new commercial nuclear power plants built in the United States was: _____.
    (a) 0 (b) 10 (c) 20 (d) 100

31. Albert Einstein is recognized as the greatest scientist of the _____ Century.

32. The Michelson and Morley experiment proved that the speed of light is a constant in a vacuum.
    (a) True or (b) False

33. A _____ reaction takes larger uranium nuclei and splits them into smaller ones.

34. A _____ reaction takes small nuclei and builds them into larger ones.

35. During a total _____ of the Sun, stars near the line of sight of the Sun are visible.

36. A positron has the same mass as a(n)_____ but with an opposite electrical charge.
    (a) hydrogen nucleus (b) proton (c) atom (d) electron

37. Most charged particles become visible because of the _____ they produce.
    (a) gravitation (b) ionization (c) light (d) magnetic field

38. A _____ _____ produces audible clicks when radioactive particles pass through it.

39. The difference in mass between the components going into a nuclear reaction and those produced by it is the: _____.
    (a) atomic mass unit (c) critical mass
    (b) binding excess (d) mass defect

40. Luis Walter Alvarez was one of the best-known _____ physicists in the United States.

41. The reaction that requires a temperature of millions of degrees and incredible pressure is atomic: _____.
    (a) fission (b) fusion (c) friction (d) fraction

42. A typical atomic power generation plant costs about _____ billion dollars.

43. Disposal of radioactive _____ is one problem of nuclear plants.

44. If an element has at least one stable isotope, then the element is described as being _____.

45. Elements located beyond uranium are called _____elements.

Circle the letter of the statement that gives the best meaning of each Life Principle:

46. *"In the middle of difficulty lies opportunity."*
    (a) The word "opportunity" is hidden within the word "difficulty."
    (b) Within every difficult situation, opportunities can be found
    (c) Difficulties often manage to spoil our opportunities.

47. *"Do you love life? Then do not squander time, for that is the stuff life is made of."*
    (a) Life is made up of segments of time; to waste our time is to waste our lives.
    (b) If we love life, we will love time.
    (c) If we love life, we will use our time wisely and not waste it.

48. *"We can do anything we want if we stick to it long enough."*
    (a) Getting what we want can be "sticky" business.
    (b) What you want is worth the effort.
    (c) The best way to reach your dreams and goals is to be persistent.

49. *"Handle them carefully, for words have more power than atom bombs."*
    (a) Words have to be handled carefully because they could explode at any minute.
    (b) Be careful how you use them, because words can wreck severe damage on people.
    (c) Words, like atom bombs should be handled carefully.

50. *"Thoughts hidden in the heart eventually find expression in life, revealing who we really are."*
    (a) Hidden thoughts reveal our true identity.
    (b) We become what we continually entertain and think about in our hearts and minds.
    (c) Hidden treasures are eventually discovered by someone who reveals secrets.