**Unit 9 Test - 🖂**

1. The half-life for beta decay of strontium-90 is 28.8 years. A milk sample is found to contain 10mg strontium-90. How many years would pass before the strontium-90 concentration would drop to 2.5mg?
   1. 57.6 yrs
   2. 96.9 yrs
   3. 97.5 yrs
   4. 0.112 yrs
2. A pulley DOES NOT
   1. Hold objects together
   2. Change the direction of the force
   3. Change the mechanical advantage
   4. Rise or fall with a load
3. A door is an example of a…
   1. Wedge
   2. First class lever
   3. Second Class lever
   4. Incline Plane
4. An element’s \_\_\_\_\_\_\_\_\_\_\_\_ is the time it takes for half of the original parent material to decay.
   1. Fission
   2. Fusion
   3. Simple Machine
   4. Half Life
5. A machine is classified as a compound machine if it….
   1. Has moving parts
   2. Is made up of two or more simple machines that operate together
   3. Has a MA greater than 1
   4. Is very efficient
6. Which element could NOT be used to radioactively age date a rock
7. Radium
8. Carbon
9. Thorium
10. Potssium
11. What type of decay causes the greatest change in mass
12. Fusion
13. Alpha
14. Beta
15. Fission
16. True or False: Every element has its own half-life
    1. True
    2. False
17. Energy cannot be created nor destroyed, only converted into different forms. The sun creates our energy, but must make a conversion. What must the sun convert to make its energy? (Hint: it was an equation)
18. Electricity
19. Mass
20. Work
21. Power
22. What process does the sun use to make this energy?
23. Radiation
24. Fission
25. Fusion
26. Decay
27. The efficiency of a machine is always less than 100 percent because….
28. A machine cannot have an MA greater than 1
29. Some work input is lost to friction
30. The work input is too small
31. The work output is too great
32. The process where nuclei with low masses are united to form nuclei with larger masses is...
33. Chemical reaction
34. Chain reaction
35. Nuclear fission
36. Nuclear fusion
37. An incline plane has a mechanical advantage, but also so…
    1. Is harder to use
    2. Lengthens the distance you have to travel
    3. Requires more force
    4. Shortens the distance you have to travel
38. What is the largest number of protons that can exist in a nucleus and still be stable…
39. 92
40. 206
41. 84
42. 83
43. Both fusion and fission reactions…
44. Cause chain reaction
45. Take place at room temperature
46. Use hydrogen as fuel
47. Produce energy
48. In which of the following scenarios is work being done, according to the scientific definition?
49. Alysia carries a reference table across the classroom.
50. Austin solves a “work” calculation in his head.
51. Matt holds a barbell still over his head in weightlifting class.
52. Brittany lifts her chair onto the desk after the afternoon announcements.
53. When a nucleus splits, it creates two smaller nuclei and a…
54. Neutron
55. Proton
56. Beta Particle
57. Alpha Particle
58. A force acting on an object does no work if…
59. The object accelerates
60. A machine is used to move the object
61. The force is not in the direction of the object’s motion
62. The force is greater than the force of friction
63. True or False: The energy from fusion is used in nuclear power plants to create energy
64. True
65. False
66. A wheelbarrow is an example of a(an)….
67. Lever
68. Inclined plane
69. Screw
70. Wedge
71. What type of nuclear reaction DOES NOT require a radioactive element
72. Fission
73. ½ life reaction
74. Fusion
75. Beta Decay
76. If Trent exerts a force of 700 N to walk 6 m up a flight of stairs in 6 s, how much power does he use?
77. 25,200 W
78. 19 W
79. 700 W
80. 4200 W
81. Nuclear fusion releases energy when
82. Uranium emits a neutron
83. Very light nuclei fuse together
84. Uranium splits into two fragments
85. Heavy ions fuse together
86. All atoms of a given element have the same
87. Mass number
88. Atomic mass
89. Number of nucleons
90. Number of neutrons
91. A neutron is released during fission reactions. What is NOT one of the three possible actions that neutron can take
92. Reenter the original nucleus
93. Cause a chain reaction
94. Be lost
95. Be absorbed
96. Which type of radiation is the **least** penetrating?
97. Beta
98. Alpha
99. X-ray
100. Gamma
101. If an element has more protons than it does electrons, it is a(an)…
102. Isotope
103. Cation
104. Anion
105. Alpha Particle
106. Which element could correctly fill in the blank for the following reaction:



1. W
2. HF
3. Os
4. Hf
5. What type of nuclear chemistry is involved when a nucleus splits into two smaller nuclei
6. Radiation
7. Fusion
8. Fission
9. Gamma
10. Which of the following is the correct representation of a beta particle



1. The beta decay of cesium-137 has a half-life of 30 years. How many years must pass to reduce a 40 mg sample of cesium-137 to 2.5 mg?
2. 60
3. 12
4. 90
5. 120
6. When dealing with nuclear decay, the \_\_\_\_\_\_\_\_\_\_ isotope is the original, unstable element
7. Daughter
8. Beta
9. Parent
10. Alpha
11. If a man moves a large box that weighs 10 N, 20 meters, in 30 seconds, how much power was used?
    1. 0.66 Watts
    2. 6.67 Watts
    3. 6000 Watts
    4. 15 Watts
12. An element with the same number of protons, but a different number of neutrons is known as a(an)…
13. Cation
14. Isotope
15. Ion
16. Gamma Particle

\_\_\_ 35. The elements of the Noble Gas Family, except for helium, have how many valence electrons?

a. 1 b. 2 c. 8 d. 18

\_\_\_ 36. Which elements are most abundant in our periodic table?

a. metals b. non-metals c. gases d. metalloids

\_\_\_ 37. Which is the formula for a binary compound?

a. KOH b. NaCO3 c. Al2S3 d. Bi(NO3)3

\_\_\_ 38. An example of a covalent compound is \_\_.

a. H2O b. CH4 c. NH3 d. all of these

\_\_\_ 39. The charge of the magnesium ion is \_\_.

a. +2 b. +1 c. 0 d. –1

\_\_\_ 40. The following reaction is best defined as \_\_. 2P + 5O2 🡪 2P2O5

a. synthesis b. single replacement c. double replacement d. decomposition

\_\_\_ 41. The reaction of zinc + copper sulfate 🡪 … would best defined as \_\_.

a. synthesis b. single replacement c. double replacement d. decomposition

\_\_\_ 42. The electrolytes of water is what type of reaction?

a. synthesis b. single replacement c. double replacement d. decomposition

\_\_\_ 43. Mixing an acid with a base causes a reaction known as \_\_.

a. oxidation-reduction b. neutralization c. precipitation d. analysis

\_\_\_\_44. When214/84 Po decays, the emission consists consecutively of an lpha\_particle, then two beta \_particles,

and finally another alpha\_particle. The resulting stable nucleus is

(A) 206/ 83 Bi (B) 210/ 83 Bi C) 206/ 82 Pb (D) 208/ 82 Pb (E) 210/ 81 Ti

\_\_\_\_45. For the types of radiation given, which of the following is the correct order of increasing ability to penetrate

a piece of lead?

(A) Alpha particles < gamma rays < beta particles (B) Alpha particles < beta particles < gamma rays

(C) Beta particles < alpha particles < gamma rays (D) Beta particles < gamma rays < alpha particles

(E) Gamma rays < alpha particles < beta particles

\_\_\_\_\_46. 251/98Cf -🡪 \_2 *n* + 131/54Xe + …?

What is the missing product in the nuclear reaction represented above?

(A) Mo 118/ 42 (B) Ru 118/ 44 (C) Mo 120/ 42 (D) Ru 120/ 44 (E) Pd 122/ 46

\_\_\_\_\_47. Which of the following elements is utilized as a shield from sources of radiation?

(A) Pb (B) Ca (C) Zn (D) As (E) Na

\_\_\_\_\_48.. The nuclide 249/96 Cm is radioactive and decays by the loss of one beta particle. The product nuclide is

(A) Pu 245/ 94 (B) Am 245/ 95 (C) Cm 248 /96 (D) Cm 250/ 96 (E) Bk 249/ 97

\_\_\_\_\_49. If 87.5 percent of a sample of pure I-131 decays in 24 days, what is the half-life of I-131?

(A) 6 days (B) 8 days (C) 12 days (D) 14 days (E) 21 days

\_\_\_\_\_50. On the sun, hydrogen nuclei are put together to make helium. What type of reaction is this?

A. fission B. fusion C. nuclear decay