Chapter 7: 7.6-7.8 Exam-blank

I don't give multiple choice problems, per se, in my class. Instead, I would ask you to choose the correct answer and explain **why** the other choices are wrong. No explanation = zero points. I also could take a question listed below and make it not multiple choice:

EXAMPLE:

1. The element in the periodic table that looks like a metal, is a poor thermal conductor, and acts as an electrical semiconductor is _____.
   a) Sn
   b) B
   c) As
   d) Si
   e) Ge

REDESIGNED: Based on the periodic table, list five (5) properties of germanium and give one explanation of how it differs from silicon.

i. Germanium is a metalloid
ii. Germanium is a poor conductor of heat
iii. Germanium is a semi-conductor
iv. Germanium is a metal because it is below the stair case.
v. Germanium is brittle.

I am sure there are other answers that describe the differences between germanium and silicon. The one I am looking for is, 'Silicon is less metallic than germanium. It is higher in the periodic table, above the staircase. We could technically classify silicon as a non-metal.'

Section 7.1 Development of the periodic table

2. Looking at the periodic table, what is an example where the order of the elements would be different if the elements were arranged in order of increasing atomic weight?

Section 7.6: Metals, metalloids, non-metals

3. What are the properties of metals, nonmetals, and metalloids?
4. What is the trend of metallic character in the periodic table?
5. Which of the following would have the greatest metallic character? Explain your choice with one BRIEF sentence.
   a) Li or Be
   b) F or I:
6. In which set of elements would all members be expected to have very similar chemical properties?
   a) O, S, Se
   b) N, O, F
   c) Na, Mg, K
   d) S, Se, Si
   e) Ne, Na, Mg

7. Of the elements below, _____ is the most metallic.

a) sodium
b) barium
c) magnesium
d) calcium
e) cesium

8. Of the elements below, _____ has the highest melting point.
   a) Ca
   b) K
   c) Fe
   d) Na
   e) Ba

9. The acidity of carbonated water is due to the _____.
   a) presence of sulfur
   b) reaction of CO2 and H2O
   c) addition of acid
   d) nonmetal oxides
   e) none of the above
10. The element in the periodic table that looks like a metal, is a poor thermal conductor, and acts as an electrical semiconductor is _____.
   a) Sn
   b) B
   c) As
   d) Si
   e) Ge

11. Nonmetals can be _____ at room temperature.
   a) solid, liquid, or gas
   b) solid or liquid
   c) solid only
   d) liquid only
   e) liquid or gas

12. Metals can be _____ at room temperature.
   a) liquid only
   b) solid only
   c) solid or liquid
   d) solid, liquid, or gas
   e) liquid or gas

13. Elements in the modern version of the periodic table are arranged in order of increasing _____.
   a) oxidation number
   b) atomic mass
   c) average atomic mass
   d) atomic number
   e) number of isotopes

14. Most of the elements on the periodic table are _____.
    a) gases
    b) nonmetals
    c) metalloids
    d) liquids
    e) metals

15. The reaction of a metal with a nonmetal produces a(n) _____.
    a) base
    b) salt
    c) acid
    d) oxide
    e) hydroxide

16. Which nonmetal exists as a diatomic solid?
    a) bromine
    b) antimony
    c) phosphorus
    d) iodine
    e) boron

Section 7.7: Trends for Group 1A and Group 2A Metals

17. The substance _____ is always produced when an active metal reacts with water.
    a) NaOH
    b) H2O
    c) CO2
    d) H2
    e) O2

18. One of the alkali metals reacts with oxygen to form a solid white substance. When this substance is dissolved in water, the solution gives a positive test for hydrogen peroxide (H2O2). When the solution is tested in a burner flame, a lilac purple flame is produced. What is the likely identity of the metal?

19. Write a balanced equation for the reaction of the white substance with oxygen.

20. Alkaline earth metals _____.
    a) have the smallest atomic radius in a given period
    b) form monoanions
    c) form basic oxides
    d) exist as triatomic molecules
    e) form halides with the formula MX

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22. Consider the following properties of an element:

(i) It is solid at room temperature.
(ii) It easily forms an oxide when exposed to air.
(iii) When it reacts with water, hydrogen gas evolves.
(iv) It must be stored submerged in oil.

Which element fits the above description the best?
a) sulfur
b) copper
c) mercury
d) sodium
e) magnesium

Section 7.8: Trends for Selected Nonmetals

23. Astatine has a(n) _____ density and a(n) _____ atomic radius compared to iodine.
a) greater; greater
b) smaller; greater
c) smaller; smaller
d) greater; smaller
e) equal; equal

24. Hydrogen is unique among the elements because _____.
i. It is not really a member of any particular group.
ii. It is the only element to exist at room temperature as a diatomic gas.
iii. It is the lightest element.
iv. It is the only element to exist at room temperature as a diatomic gas.
v. It exhibits some chemical properties similar to those of groups 1A and 7A.
a) i, iii, v
b) i, ii, iii, iv, v
c) i, iv, v
d) iii, iv
e) ii, iii, iv, v

25. Which element is solid at room temperature?
a) Cl2
b) F2
c) Br2
d) I2
e) H2

26. Which of the following statements is not true for oxygen?

a) The most stable allotrope of oxygen is O2.
b) The chemical formula of ozone is O3.
c) Dry air is about 79% oxygen.
d) Oxygen forms peroxide and superoxide anions.
e) Oxygen is a colorless gas at room temperature.

27. All of the halogens _____.
    a) exist under ambient conditions as diatomic gases
    b) tend to form positive ions of several different charges
    c) tend to form negative ions of several different charges
    d) exhibit metallic character
    e) form salts with alkali metals with the formula MX

28. What is an allotrope and what are the common allotropes of oxygen?

29. An element A (not it's real symbol) is in the family that has the most striking display of changing metallic character going down a column.
    a) Factoids about element A: It was considered a minor factor in the down fall of Rome because citizens of Rome (and Greecused it's acetate salt as a sweetening agent.
    b) In Victorian times it was used to solder cans of food, to the detriment of Franklin's expedition, which set off in 1848 to find the Northwest Passage. The permanently frozen graves of the members were discovered in 1980; autopsies of the bodies showed deadly concentrations of this element in the tissues.
    c) It was an additive in gasoline, which led to its presences in the atmosphere. Because it is very malleable, it was used to seal wine bottles at one time.
    d) Currently, (no pun intendeit is used as electrodes in car batteries, by Superman's foes to shield them from his x-ray vision, and by your dentist to shield you from x-rays. It forms two oxides AO and AO2. There are a lot of clues leading to the identity of element A.
        (i) What is element A?
        (ii) What are the formulas of the two oxides?
        (iii) What did the members of Franklin's expedition die from? Give a short sentence explaining your choice.

30. Which one of the following is a metalloid?
    a) Si
    b) S
    c) Cl
    d) In
    e) Li

31. Which one of the following is a metal?
    a) Li
    b) S
    c) I
    d) He

e) Si

32. Of the elements below, _____ is the most metallic.
    a) Sn
    b) P
    c) Br
    d) Rn
    e) As

33. 25) Of the elements below, _____ is the least metallic.
    a) Ne
    b) F
    c) Cl
    d) O
    e) S

34. Which group 6A element is a metal?
    a) tellurium and polonium
    b) sulfur
    c) selenium
    d) tellurium
    e) polonium

35. Which periodic table group contains only nonmetals?
    a) 8A
    b) 2A
    c) 6A
    d) 7A
    e) 5A

36. Of the halogens, which are gases at room temperature and atmospheric pressure?
    a) fluorine, bromine, and iodine
    b) fluorine, chlorine, and bromine
    c) fluorine, chlorine, bromine, and iodine
    d) fluorine, chlorine, and iodine
    e) fluorine and chlorine