**Science 10**

**PRACTICE EXAM**

**Name - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**INSTRUCTIONS**

1. Write your first and last name on the line provided above.

2. All parts of the practice exam will be completed on this paper.

3. Be mindful of the time.

**Part 1 – Multiple Choice (Value - 40) - Circle the letter of the best answer.**

1. The *Certainty Rule* is used to

 (a) determine the number of significant digits when adding and subtracting measured values

 (b) determine the number of significant digits when adding and multiplying measured values

 (c) determine the number of significant digits when subtracting and dividing measured values

 (d) determine the number of significant digits when multiplying and dividing measured

2. You are riding your bicycle west. If you decide to decrease your velocity, in what

 direction is your acceleration?

 (a) south

 (b) north

 (c) east

 (d) west

3. Which list includes only nonmetals?

 (a) krypton, nitrogen, helium, xenon

 (b) titanium, zinc, copper, lead

 (c) gold, mercury, carbon, iron

 (d) nickel, platinum, chlorine, aluminum

4. Which of the following includes only scalar quantities?

 (a) displacement, acceleration and velocity

 (b) distance, time, and speed

 (c) position, displacement and speed

 (d) displacement, speed and velocity

5. A family in the periodic table that contains only nonmetals is the

 (a) actinides

 (b) alkali metals

 (c) lanthanides

 (d) halogens

6. Which substance in the following list is an element?

 (a) ammonia

 (b) methane

 (c) bismuth

 (d) water

7. When the following equation is balanced, the numerical coefficients for S4 and I2

 are respectively:

 S4 + I2 —> S2I

 (a) 2, 8

 (b) 8, 2

 (c) 1, 1

 (d) 2, 1

8. In 1997, Thrust SSC, the world’s fastest jet-engine car, travelled 604 m at an average speed of

 341 m/s. The length of time it took was

 (a) 0.565 s

 (b) 1.77 s

 (c) 263 s

 (d) 945 s

9. An atom has a total of 18 electrons. These electrons are found in 3 orbits that have:

 (a) 6 electrons each

 (b) 8, 8, and 2 electrons, moving out from the nucleus;

 (c) 2, 8, and 8 electrons, moving out from the nucleus;

 (d) 2, 10, and 6 electrons, moving out from the nucleus.

10. Amphibians are exposed to more environmental hazards than other forms of life because:

(a) they have short life spans.

(b) they reproduce by laying eggs.

(c) they spend part of their life in an aquatic environment and part in a terrestrial environment.

(d) they have more predators than other organisms.

11. If Cl2 and Na2S solutions are mixed together, a:

 (a) double displacement reaction occurs

 (b) single displacement reaction occurs

 (c) decomposition occurs

12. A speed of 2.8 m/s is equal to

 (a) 0.78 km/h

 (b) 5.6 km/h

 (c) 10 km/h

 (d) 14 km/h

13. An atom becomes an ion with a charge of +2 when it:

 (a) gains 2 protons

 (b) loses 2 neutrons

 (c) loses 2 electrons

 (d) gains 2 electrons

14. Which of the following is an example of speed?

 (a) 40 km

 (b) 20 km/h[E]

 (c) 1.5 m [right]

 (d) 15 km/h

15. Which of the following graphs illustrates an object that is speeding up?



 (a) A

 (b) B

 (c) C

 (d) D

16. Boron-11 has \_\_\_ neutrons.

 (a) 11

 (b) 6

 (c) 5

 (d) 3

17. The bacteria that break down nitrates and return the nitrogen gas to the atmosphere are called:

(a) nitrogen-fixing

(b) nitrate-fixing

(c) nitrite-fixing

(d) denitrifying

18. Which element is a member of the halogens?

 (a) astate

 (b) copper

 (c) radium

 (d) potassium

19. Protons are

 (a) negatively charged particles found outside the nucleus of an atom.

 (b) neutral particles found in the nucleus of an atom.

 (c) positively charged particles found outside the nucleus of an atom.

 (d) positively charged particles found in the nucleus of an atom.

20. What type of reaction does the following equation represent?

 AB + CD CB + AD

 (a) single displacement

 (b) combustion

 (c) double displacement

 (d) decomposition

21. A beryllium ion has

 (a) 4 protons, 6 electrons and an ionic charge of 2-.

 (b) 4 protons, 2 electrons and an ionic charge of 2+.

 (c) 4 protons, 6 electrons and an ionic charge of 2+.

 (d) 4 protons, 2 electrons and an ionic charge of 2-.

22. In the Periodic Table, elements with similar properties are grouped in:

 (a) diagonal rows

 (b) horizontal rows

 (c) periods

 (d) vertical columns

23. Which of the following is not considered to be a reservoir for inorganic carbon?

(a) trees

(b) Earth’s crust

(c) oceans

(d) the atmosphere

24. Which of the following is a chemical property?

 (a) freezing

 (b) burning

 (c) dissolving

 (d) boiling

25. The term “consumer” is used to define an organism that:

(a) eats only plants;

(b) eats only animals;

(c) may eat plants or animals;

(d) causes decomposition in dead organisms.

26. Biodiversity is a term that is used to describe differences that exist in the:

(a) abiotic environment

(b) variety of organisms

(c) sizes of populations

(d) rates of reproduction

27. A positive slope on a distance-time graph indicates:

time

distance

 (a) the object’s speed is increasing.

 (b) the object is not moving.

 (c) the object’s speed is decreasing.

 (d) the object has a constant speed.

28. The reaction below is an example of the reaction type called:

 A + B —> AB

 (a) combustion

 (b) decomposition

 (c) synthesis

 (d) single displacement

29. An element that does form a diatomic molecule is

 (a) carbon

 (b) sulfur

 (c) phosphorous

 (d) hydrogen

30. John walks to his friend’s house 5 blocks east and then walks 15 blocks west to his own

 home. His displacement is

 (a) 10 blocks

 (b) zero blocks

 (c) 10 blocks [E]

 (d) 10 blocks [W]

31. A measurement of 0.020 km has

(a) 2 significant digits

 (b) 4 significant digits

 (c) 5 significant digits

 (d) 6 significant digits

32. If 1min = 60 s, then 42 s equals

 (a) 12 min

 (b) 0.70 min

 (c) 178 min

 (d) 2520 min

33. A group of organisms of the same species living together is referred to as a(n):

(a) ecosystem

(b) community

(c) population

(d) biome

34. The slope of a distance-time graph will determine the

 (a) distance of the object

 (b) speed of the object

 (c) acceleration of the object

 (d) displacement of the object

35. Acceleration can best be defined as

 (a) the speed at which an object is travelling at a particular instant

 (b) the displacement of an object divided by time

 (c) the total distance covered over the total time measured

 (d) the rate of change in velocity

36. In any chemical reaction, the total mass of the reactants is always equal to the total mass of

 materials produced. This is known as the law of :

 (a) chemical reactions

 (b) conservation of mass

 (c) constant proportion

 (d) conservation of energy

37. Which chemical formula correctly matches the chemical name provided?

 (a) Ni2(SO4)3 – nickel (III) sulfate

 (b) PbCO3 – lead (IV) carbonate

 (c) Fe(ClO3)2 – iron (III) chlorate

 (d) Cu2PO4 – copper (I) phosphate

38. A vector quantity has

 (a) direction

 (b) size

 (c) size and direction

 (d) none of the above

39. The rate of many reactions is approximately doubled for every 10OC rise in temperature. If

 such a reaction takes 30 min at 65 OC, at 75 OC it should take about:

 (a) 5 min

 (b) 10 min

 (c) 15 min

 (d) 20 min

40. Which of the following is a molecular compound held together by covalent bonds?

 (a) LiBr

 (b) CaO

 (c) H2O

 (d) Mg3P2

41. A group of organisms of different species that live and interact together is referred to as a(n):

(a) ecosystem

(b) community

(c) population

(d) biome

42. An organism that makes its own food from basic nutrients is called a(n):

(a) autotroph

(b) heterotroph

(c) decomposer

(d) energy source

43. An organism that cannot produce its own food from basic nutrients is called a(n):

(a) autotroph

(b) heterotroph

(c) decomposer

(d) energy source

44. An example of an autotroph is a:

(a) mushroom

(b) deer

(c) maple tree

(d) the sun

45. The role that an organism plays in the ecosystem is called a:

(a) trophic level

(b) producer

(c) niche

(d) consumer

46. A non-native species that is introduced into an ecosystem is said to be:

(a) accidental

(b) exotic

(c) alien

(d) competing

47. An organic compound is one that:

(a) can only be produced by a living organism;

(b) contains atoms that must include carbon, hydrogen, and phosphorus;

(c) contains atoms that must contain carbon and hydrogen;

(d) is released into the atmosphere as a result of combustion of fossil fuels.

48. Atoms of carbon are:

(a) constantly being created;

(b) constantly being destroyed;

(c) continuously recycled;

(d) transported to Earth by the sun’s rays.

49. After DDT had been used for a period of time:

(a) all of the pests it was used on were killed.

(b) it began to accumulate in the bodies of top carnivores.

(c) it had no negative effects because it broke down immediately after use.

(d) it had no more effects, either positive or negative.

50. Before nitrogen can be used by living organisms, it must be converted to water-soluble:

(a) ammonia

(b) nitrates

(c) nitrites

(d) nitrogenous wastes

**Part 2 – Compounds (Value - 16)**

**State whether each compound is ionic or molecular and give the compound name or chemical formula as required.**

  **Ionic or molecular Name or Formula**

1. CrBr3 \_\_\_\_\_I\_\_\_\_\_\_\_\_\_\_\_ \_Chromium bromide\_\_\_\_\_

b) BeSO4 \_\_\_\_\_\_I\_\_\_\_\_\_\_\_\_ beryllium sulfate\_\_\_\_\_\_\_\_\_

1. AlI3 \_\_\_\_\_I\_\_\_\_\_\_\_\_\_\_ \_aluminum iodide \_\_\_\_

d) FI3 \_\_\_M\_\_\_\_\_\_\_\_\_\_\_\_ \_\_fluorine triiodide\_\_\_\_\_\_

e) cobalt (III) sulfide \_\_\_\_I\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_Co2S3\_\_\_\_\_\_\_\_\_\_\_\_\_\_

f) gallium phosphide \_\_\_\_I\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_GaP\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. dinitrogen tetraoxide \_\_\_\_\_\_\_\_\_M\_\_\_\_\_\_ \_\_\_\_\_\_\_N2O4\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. potassium dichromate \_\_\_\_\_\_I\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_K2Cr2O7\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Part 3 – Atoms (Value - 15)**

**Write your answers in the space provided.**

 (b) Circle the metal and underline the nonmetal. **(1)**

 magnesium fluorine

 (d) What are the charges on the magnesium and fluoride ions? **(2)**

 **Mg +2 F-1**

 (e) Give the chemical formula and the chemical name of the compound formed when

 magnesium and fluorine react. **(2)**

 MgF2 magnesium fluoride

**Part 4 – Velocity-Time Graph (Value - 14)**

**Show your work in the space provided.**

1. Data was collected for an object in motion. Draw a velocity-time graph for the data in the

 chart. Remember to include a title for the graph, labels for the axes and a line of best-fit**. (8)**

|  |  |
| --- | --- |
| **Time (s)** | **Velocity (m/s)** |
| 0.0 | 0.0 |
| 0.5 | 5.0 |
| 1.0 | 10 |
| 1.5 | 15 |



30

25

20

15

10

5.0

0

3.0

2.5

2.0

1.5

1.0

0.5

2. Using the data in the graph, calculate the acceleration of the object. Show your work. **(3)**

3. a) How fast was the object moving at t = 1.25 s? **(1)**

 b) At what t value would the object be travelling at 7.5 m/s? **(1)**

4. What is the displacement of the object between t = 0.0 s and t = 1.5 s? Show your work. **(3)**

**Part 5 – Identifying and Balancing Reactions**

Balance the following equations & state the type of reaction. **(10)**

Types – synthesis (S), decomposition (D), single replacement (SR), double replacement (DR) or

 combustion (C)

 **TYPE**

a) \_\_\_\_CrCl3  \_\_\_\_\_\_\_

b) \_\_\_\_ KCl + \_\_\_\_ Mg(NO3)2  \_\_\_\_\_\_\_

 c) \_\_\_\_Co + \_\_\_\_O2  \_\_\_\_\_\_\_\_

d) \_\_\_\_ Zn + \_\_\_\_H2SO4   *\_\_\_\_\_\_\_\_*

e) \_\_\_\_C2H4 + \_\_\_\_O2  ­­ \_\_\_\_\_\_\_\_\_\_\_\_

**Part 6 – Chemical Reactions (Value - 14)**

**Complete this part on this paper.**

Predict the products of the reactions then complete the chemical equation. Remember to balance each equation.

a) \_\_MgF2 + \_\_Li3P

b) \_\_CH4 + \_\_O2

c) \_\_SrBr2

d) \_\_ Zr + \_\_ I2

e) \_\_\_K2SO4+ \_\_\_ Al

**Part 7 – Word Problems (Value - 28)**

**Show work for full value. Include a word statement.**

1. A hot air balloon flew 12 h at an average speed of 210 km/h. How far did it travel? **(5)**

2. A race car accelerates at 5.0 m/s2 [W]. If its initial velocity is 23 m/s [W], what is its

 final velocity after 2.7 s? **(5)**

3. A truck is travelling at 22 m/s east when the driver notices a speed limit sign for the town

 ahead. If it takes the driver 6.9 s to slow down to a velocity of 14 m/s east, what is the

 acceleration of the truck? **(4)**

4. A student travels 3.0 m [E] in 8.0 s then 4.6 m [W] in 12 s.

1. What is his velocity of the student while traveling east? **(4)**

 b) What is the student’s average velocity? **(5)**

5. The peregrine falcon is the fastest of the flying birds. If a peregrine falcon can fly 1.73 km

 downward in 25 s, what is the average velocity of the bird in km/h? **(5)**