Key

Science 10 Practice Final

1. The following WHMIS symbols appear on a container of solvent.


These two symbols indicate that the solvent is
   a. biohazardous infectious material and poisonous and infectious material causing immediate and serious toxic effects
   b. poisonous and infectious material causing other toxic effects and corrosive material
   c. poisonous and infectious material causing immediate and serious toxic effects and corrosive material
   d. poisonous and infectious material causing other toxic effects and dangerously reactive material.

2. Which of the following symbols indicates that a container is explosive?

a. 
b. 
c. 
d. 

3. Two solutions are mixed together and a cloudy opaque material forms. From your observations you conclude that
   a. A gas is forming
   b. A precipitate is forming
   c. The temperature is rising
   d. No reaction is occurring

4. Which of the following is NOT part of the ideas John Dalton proposed in his model?
   a. Atoms of different elements have different properties
   b. All matter is made up of small invisible particles
   c. Matter is neither created nor destroyed during a chemical reaction
   d. All the atoms of an element have identical properties

5. Which column in the periodic table contains elements with two electrons in their valence energy levels?
   a. The first column on the left
   b. The first column on the right
   c. The second column on the left
   d. The second column on the right

6. An atom of oxygen has 8 protons, 9 neutrons, and 8 electrons. Its mass number is
   a. 8
   b. 9
   c. 16
   d. 17

7. In the formula $Na_3PO_{4(s)}$, the charge on the polyatomic ion is
   a. 3-
   b. 3+
   c. 4-
   d. 4+

8. The correct IUPAC name for $N_2O_{3(s)}$ is
   a. nitrous oxide
   b. nitrogen oxide
   c. nitrogen trioxide
   d. dinitrogen trioxide

9. The following are some properties of substances.
   I. soluble in water
   II. solid at room temperature
   III. conducts electricity as a solid

   Which of the properties are true for ionic compounds?
   a. I and III
   b. I and II
   c. II and III
   d. I, II, and III

10. Which of the following compounds is only slightly soluble in water?
   a. K_2SO_4
   b. AgCl
   c. $Ba(OH)_2$
   d. $KclO_4$

11. Which of the following are general properties of acids?
   I. has no reaction with metal
   II. tastes sour
   III. conducts electricity
   a. I and III
   b. I and II
   c. II and III
   d. I, II and III

12. Which of the following is a base?
   a. K_3PO_4
   b. HCOOH
   c. HNO_3
   d. NH_4OH

H^+ = acid = "COOH"

OH^- = base

13. An example of an endothermic reaction is
   a. Combustion
   b. Cellular respiration
   c. The reaction in a cold pack
   d. The reaction in a hot pack

14. The balanced equation for the reaction of oxygen with methane is
   a. $O_{2(g)} + CH_{4(g)} \rightarrow CO_{2(g)} + H_2O_{(g)}$
   b. $O_{2(g)} + CH_{4(g)} \rightarrow CO_{2(g)} + 2H_2O_{(g)}$
   c. $2O_{2(g)} + CH_{4(g)} \rightarrow CO_{2(g)} + 2H_2O_{(g)}$
   d. $2O_{2(g)} + CH_{4(g)} \rightarrow CO_{2(g)} + H_2O_{(g)}$

15. Lithium metal reacts with nitrogen gas to form a solid white powder. The coefficient of the formula for the product is
   a. 1
   b. 2
   c. 3
   d. 4

$6Li + N_2 \rightarrow 2Li_3N$

16. The following balanced equation represents the reaction of aluminum with copper(II) chloride.
   $2Al_{(s)} + 3CuCl_{2(aq)} \rightarrow 2AlCl_{3(aq)} + 3Cu_{(s)}$

   This is an example of:
   a. formation reaction
   b. combustion reaction
   c. single replacement reaction
   d. double replacement reaction

($CuCl_2$)

+2 -2

17. The products of the reaction of aqueous sodium iodide, $NaI_{(aq)}$, and aqueous lead(II) nitrate, $Pb(NO_3)_{2(aq)}$, are
    a. $NaPb_{(s)} + I_2NO_{3(aq)}$
    b. $Na_{(s)} + I_2NO_{3(aq)}$
    c. $NaNO_{3(aq)} + PbI_{(s)}$
    d. $NaNO_{3(aq)} + PbI_{2(s)}$

Al = 26.98 × 1 = 26.98
O = 16.00 × 3 = 48.00
H = 1.01 × 3 = 3.03

$Al(OH)_3$

18. The molar mass of aluminum hydroxide is
    a. 43.99 g/mol
    b. 78.01 g/mol
    c. 87.98 g/mol
    d. 97.95 g/mol

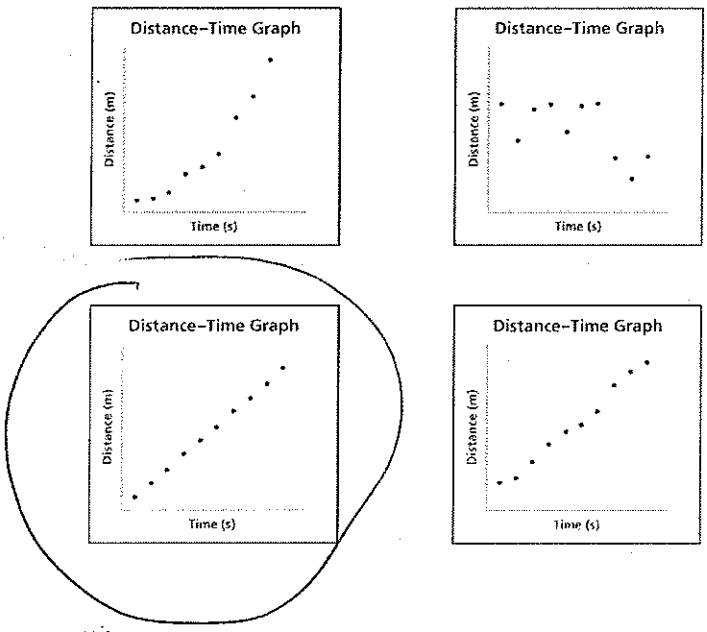
19. In the balanced chemical equation, $Cu_{(s)} + 2AgNO_{3(aq)} \rightarrow Cu(NO_3)_{2(aq)} + 2Ag_{(s)}$, one mole of copper and two moles of silver nitrate will produce
    a. One mole of $Cu(NO_3)_{2(aq)}$ and one mole of $Ag_{(s)}$
    b. One mole of $Cu(NO_3)_{2(aq)}$ and two moles of $Ag_{(s)}$
    c. Two moles of $Cu(NO_3)_{2(aq)}$ and one mole of $Ag_{(s)}$
    d. Two moles of $Cu(NO_3)_{2(aq)}$ and two moles of $Ag_{(s)}$

20. Which describes an object with uniform motion?
    a. The object moves with constant speed along a straight path
    b. The object moves with constant speed along a curved path
    c. The object moves so that an imaginary line segment from the object to a reference point changes in length
    d. The object moves so that an imaginary line from the object to a reference point changes direction

21. A tsunami, a great ocean wave, travels a distance of 7.2×10^6 m in 2.88×10^4 s. What is the average speed of the tsunami?
    a. 4.0×10^1 m/s
    b. 2.5×10^2 m/s
    c. 9.0×10^2 m/s
    d. 2.1×10^3 m/s

$v = \frac{d}{t}$

22. Which of the following distance-time graphs most closely describes uniform motion?



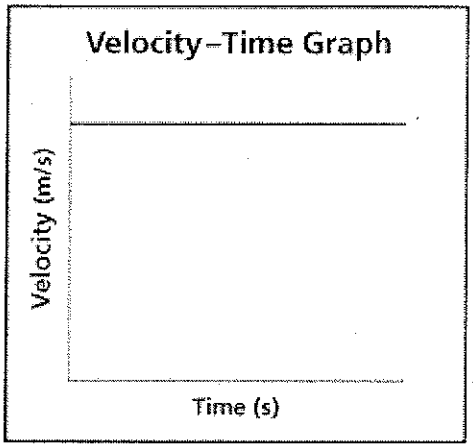
23. A group of students considered the following statements about scalar quantities and vector quantities.

I. A scalar quantity indicates how much and what direction
II. A scalar quantity indicates how much and no direction
III. A vector quantity indicates how much and direction
IV. A vector quantity indicates how much and no direction

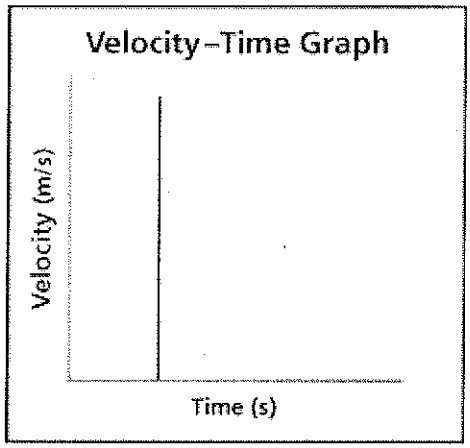
Which of these statements is/are correct?

a. I only
b. I and IV
c. I and III
d. IV only

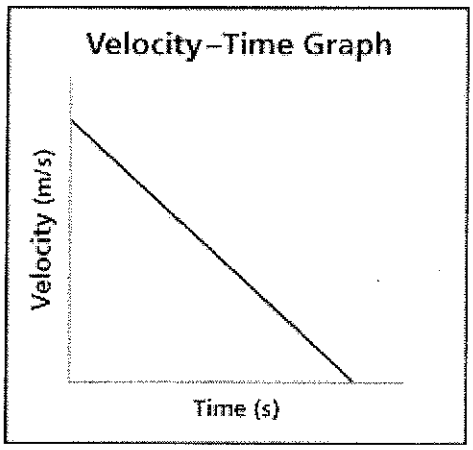
24. Which velocity-time graph indicates positive acceleration?



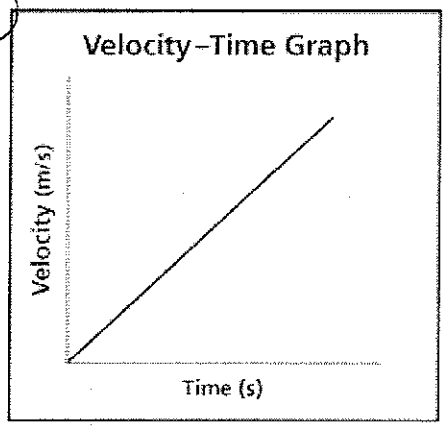
B.



C.



D.



25. The velocity of a falling object changed as is indicated by the following data. Based on the data in the table, what is the acceleration of the object as it falls?

Time (s)	0.0	2.0	4.0	6.0
Velocity (m/s)	0.00	19.6	39.2	58.9

a. 2.0 m/s^2 up
b. 9.8 m/s^2 down
c. 20 m/s^2 down
d. 59 m/s^2 up

$W = Fd$

26. Madison applied a force of 150 N in a horizontal direction to a sleigh. Meanwhile the sleigh slid 30.0 m across a level surface of snow. What is the work done on the sleigh by Madison?
    a. 2.00×10^{-1} J
    b. 5.00 J
    c. 5.00×10^{1} J
    d. 4.50×10^{3} J

27. What is the gravitational potential energy of an object?
    a. Energy due to only the motion of an object
    b. Potential energy stored in the nuclei of the object's atoms
    c. Energy due only to the height of the object above the Earth's surface
    d. Energy due to the motion and position of the object above the Earth's surface

28. Manuel placed his 1.42 kg science textbook on the shelf at the top of his locker. The shelf supported the textbook at a height of 1.78 m. At this height, what is the gravitational potential energy of the textbook?
    a. 1.26 J
    b. 2.53 J
    c. 12.4 J
    d. 24.8 J

$E_p = mgh = 1.42 \cdot 9.81 \cdot 1.78 = 24.796$ J

29. A car with a mass of 1800 kg is travelling at a speed of 16.0 m/s. What is the kinetic energy of the car?
    a. 4.61×10^{5} J
    b. 5.76×10^{4} J
    c. 2.30×10^{5} J
    d. 2.88×10^{4} J

$E_k = \frac{1}{2}mv^2 = \frac{1}{2} 1800 \cdot 16 = 2.3 \times 10^5$

30. A rock having mass of 1.25 kg is dropped from the edge of a cliff to the surface of the water 35.0 m below. With what speed does the rock strike the surface of the water?
    a. 20.7 m/s
    b. 26.2 m/s
    c. 172 m/s
    d. 442 m/s

$E_p = mgh = 1.25(9.81)35 = 429.1875$

$E_p = E_k$ $v = \sqrt{\frac{2E_k}{m}}$

$v = 26.20$ m/s

31. Which is an expression of the first law of thermodynamics?
    a. No process can be 100% efficient
    b. The total energy of a system and its surroundings remain constant
    c. Thermal energy always flows from a hot object to a cool object
    d. No process can remove thermal energy from a source and convert it entirely into mechanical energy

32. The Watt steam engine was far more efficient than the earlier Newcomen steam engine. What design feature did the Watt steam engine possess that made it more efficient?
    a. A flywheel was connected to piston rods
    b. The piston rod was connected to a pivoting beam
    c. The cylinder was used to heat and cool the steam
    d. A separate condenser was used to cool the steam

33. A construction crane is used to lift a load of materials. The crane performs 7.2×10^{3} J of output work while its input energy is 1.2×10^{4} J. What is the percent efficiency of the crane?
    a. 16%
    b. 60%
    c. 66%
    d. 167 %

34. The power of the eyepiece of a microscope is 10X and the power of the high-power lens is 120X. The total magnification of a specimen viewed through the high-power lens is
    a. 10X
    b. 120X
    c. 1000X
    d. 1200X

35. Louis Pasteur performed an experiment to disprove the concept of spontaneous generation. In this experiment, Pasteur allowed dust to access one of the flasks, which resulted in the appearance of mould in that flask but not in the other. The growth of the mould is what type of variable?
    a. Controlled variable
    b. Manipulated variable
    c. Responding variable
    d. Spontaneous variable

36. Which of the following scientists proposed that the cell is the basic unit of all organisms?
    a. Pasteur
    b. Virchow
    c. Brown and Schleiden
    d. Schwann and Schleiden

37. A disadvantage of staining a cell for viewing under a light microscope is that
    a. Staining kills the cells
    b. The cell all becomes one colour
    c. Only the cell membrane can be seen in a stained cell
    d. The contrast between internal parts is reduced

38. Which technology is used to obtain detailed information about the exterior of a specimen?
    a. Confocal technology
    b. X-ray crystallography
    c. Scanning Electron Microscope (SEM)
    d. Transmission Electron Microscope (TEM)

39. Rod-like structures of the cell where cellular respiration occurs are called
    a. lysosomes
    b. ribosomes
    c. Golgi apparatus
    d. mitochondria

40. The phospholipids bilayer is part of the
    a. chloroplasts
    b. cell membrane
    c. endoplasmic reticulum
    d. Golgi apparatus

41. The direction in which water or solutes move through a cell membrane is determined by
    a. passive transport
    b. rate of diffusion
    c. carrier proteins
    d. concentration gradient

42. An egg that has its shell dissolved in vinegar is then placed in a beaker of distilled water. Which of the following occurs?
    a. The egg swells
    b. The egg shrinks
    c. The egg loses mass
    d. The egg does not change

43. As a cell decreases in size
    a. The surface area increases
    b. The surface area to volume ratio increases
    c. The volume of the cell increases
    d. More molecules need to be transported across its surface

44. The part of the leaf containing the structures that allow carbon dioxide to enter the leaf is
    a. epidermis
    b. spongy mesophyll
    c. palisade tissue
    d. vascular tissue

45. The loss of water through stomata and lenticels is known as
    a. osmosis
    b. plasmolysis
    c. transpiration
    d. perspiration

46. The force that pulls water up from the roots through the xylem in the stem to the leaves is caused by
    a. gravity
    b. turgor pressure
    c. a pressure difference in the leaves

d. transpiration pull caused by the evaporation of water from the leaves

47. The tip of a plant is covered by an opaque cap, and the plant is exposed to light on one side. The plant will
    a. Bend away from the light
    b. Bend toward the light
    c. Grow straight up
    d. Not grow at all

48. Positive gravitropism is illustrated by
    a. A stem bending towards the light
    b. A stem growing against the force of gravity
    c. A root growing against the force of gravity
    d. A root growing in the direction of gravity

49. Which gases together make up 99% of Earth's atmosphere?
    a. Nitrogen, helium, hydrogen and carbon dioxide
    b. Carbon dioxide and oxygen
    c. Nitrogen and oxygen
    d. Helium and oxygen

50. Earth's lithosphere is best described as the
    a. envelope of the Earth that includes bodies of water and water vapour in the air
    b. layer of Earth that can support life
    c. layer of gases surrounding the Earth
    d. solid outer portion of the Earth

51. Some tropical plants can grow outside Vancouver, BC but are not able to grow outside in Edmonton, AB. Which factor would most likely account for this difference in plant survivability?
    a. Climate
    b. Altitude
    c. Weather
    d. Soil characteristics

52. Which gas in the atmosphere is the main contributor to the Greenhouse effect?
    a. carbon dioxide
    b. nitrous oxide
    c. water vapour
    d. methane

53. Which statement about the net radiation budget is correct?
    a. The outgoing radiation is due to the albedo of Earth's surface
    b. The total of Earth's incoming radiation is less than its outgoing radiation
    c. The total of Earth's incoming radiation and its outgoing radiation is closely balanced
    d. The outgoing radiation is radiation due to the albedo of Earth's surface and reflection from Earth's atmosphere

54. The Coriolis effect is the
    a. Movement of air from the equator to the polar regions
    b. Deflection of moving air from the straight path due to mountain ranges
    c. Deflection of a moving object from a straight path due to Earth's rotation
    d. Deflection of a moving object from a straight path due to Earth's angle of inclination

55. The theoretical specific heat capacity of water is 4.19 J/g°C. What is the thermal energy needed to raise the temperature of 100g of water from 18.0 °C to 38.0 °C?
    a. 9.38×10^1 J
    b. 2.33×10^2 J
    c. 4.19×10^3 J
    d. 8.38×10^3 J

$Q = mc\Delta t$
$= 100(4.19)(20) = 8380$

56. The theoretical heat of fusion of ice is 6.01 kJ/mol. What is the thermal energy needed to melt 9.99 mol of ice at 0.00°C?
    a. 60.0 kJ
    c. 1.08×10^3 kJ

$Q = \Delta H_f n \quad (6.01)(9.99$

b. 339 kJ

d. 1.86×10^3 kJ

57. Which biome receives the least precipitation?

a. taiga

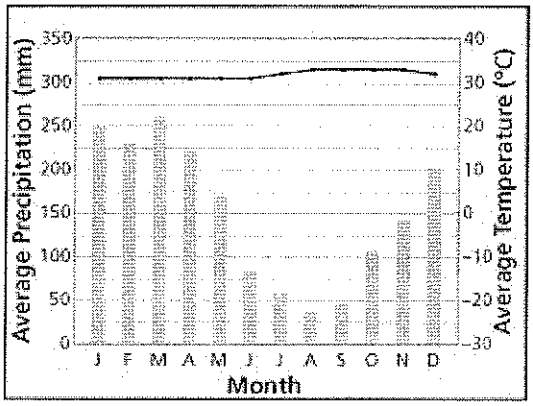
b. tundra

c. grassland

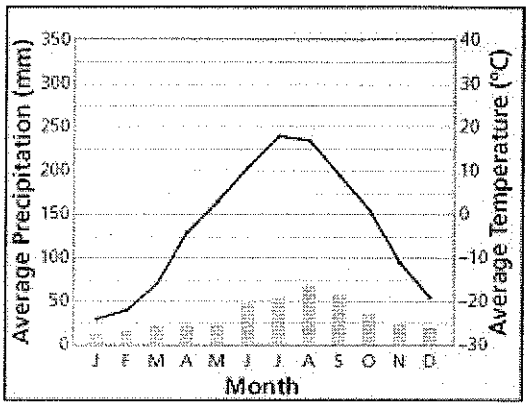
d. rain forest

Use the following climatographs to answer question 58.

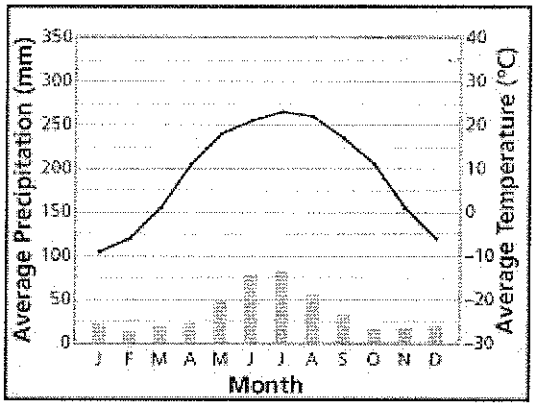
Climatograph I



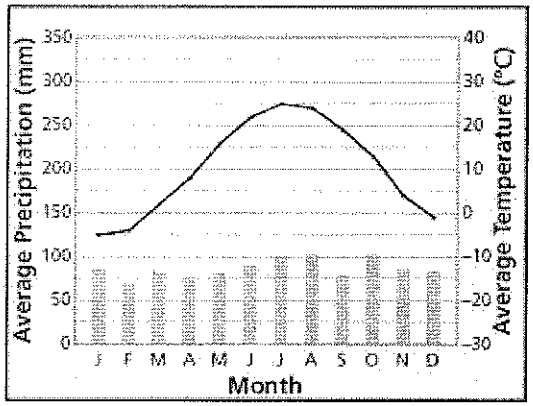
Climatograph II



Climatograph III



Climatograph IV



58. Which climatograph is most likely describing the climate of the deciduous forest biome?

a. I

b. II

c. III

d. IV

59. What is a carbon sink?

a. A hole or low place in land or rock

b. A process that removes carbon dioxide

c. The observed increase in Earth's temperature

d. The absorption of thermal energy by atmospheric gases

60. Halocarbons are greenhouse gases that

a. Are released from the digestive system of farm animals and landfill sites

b. Are used as a coolant in air conditioners and refrigerators

c. Are emitted when applying artificial fertilizers
d. Are products of the combustion of natural gas

61. What is the Kyoto Protocol?
    a. A framework for making international action-plan agreements relating to climate change
    b. An international agreement to reduce the production of carbon dioxide
    c. A framework for sharing research made by climatologists
    d. An international agreement to phase out CFC's

62. Which organization was formed to make the most reliable assessment of the existing knowledge about climate change?
    a. Intergovernmental Panal on Climate Change
    b. United Nations Environmental Program
    c. World Meteorological Organization
    d. United Nations General Assembley

Written Response

63. Balance the following equation and indicate the reaction type. Name the reactants and the products.

3 $Mg_{(s)}$ + 2 $H_3PO_{4(aq)}$ → 3 $H_{2(g)}$ + _____ $Mg_3(PO_4)_{2(s)}$ Single replacement.

64. Calculate the molar mass of copper(II) chloride

65. List two things you could do to conserve energy in your daily life
Turn off lights, Short Showers.

66. Explain how cogeneration at thermal power stations can be used to conserve energy. Omit

67. Determine whether each statement is true or false.
    F a. The electron microscope has completely replaced the light microscope in study of biological specimens
    T b. Diffusion requires no input of energy
    F c. Liposomes are fluid-filled sacs made from a synthetically produced membrane
    F d. Xylem tissue is formed from sieve-tube cells that contain cytoplasm
    e. Charles Darwin and his son Francis were first to propose that auxin is the specific substance responsible for initiating the phototropic response Omit
    F f. Both sugar and water flow into the phloem through active transport

68. In paragraph form explain why atmospheric carbon dioxide levels increased after the Industrial Revolution.