

Middle Grades General Science 5-9
Florida Teacher Certification Examination
Test Preparation Course
Pre-test

Teaching & Leadership Center

DIRECTIONS: Read each item and select the best response.

1. Which of the properties listed below is a characteristic of a gas but not of a liquid?

- A. It has the ability to flow.
- B. It assumes the shape and fills the volume of its container.
- C. Its molecules are constantly in motion.
- D. Its volume varies depending on temperature.

2. A sealed container is filled with hydrogen gas at standard conditions (101 kPa at 273 k).

Assuming ideal conditions and behavior, what will be the pressure of the gas in the chamber if it is heated to 546 k?

- A. 34 kPa
- B. 51 kPa
- C. 202 kPa
- D. 303 kPa

3. In 1922, Neils Bohr developed an explanation of atomic structure that underlies regularities in the periodic table of elements dealing with the

- A. proton.
- B. neutron.
- C. electron.
- D. nucleus.

4. A chemical bond consisting of atoms or ions of two or more different substances is a(an)

- A. compound.
- B. element.
- C. mixture.
- D. alloy.

5. The balanced chemical equation for the formation of aluminum oxide is

- A. $\text{Al} + \text{O}_2 \rightarrow \text{Al}_2\text{O}_2$.
- B. $4\text{Al} + 3\text{O}_2 \rightarrow 2\text{Al}_2\text{O}_3$.
- C. $3\text{Al} + \text{O}_2 \rightarrow 2\text{Al}_3\text{O}$.
- D. $\text{Al} + \text{O}_2 \rightarrow \text{AlO}$.

6. H₂O (water) is an example of a(an)

- A. polar bond.
- B. non-polar bond.
- C. ionic bond.
- D. non-covalent bond.

7. AB + CD → AD + BC

What type of reaction is given above?

- A. combination
- B. decomposition
- C. double displacement
- D. single displacement

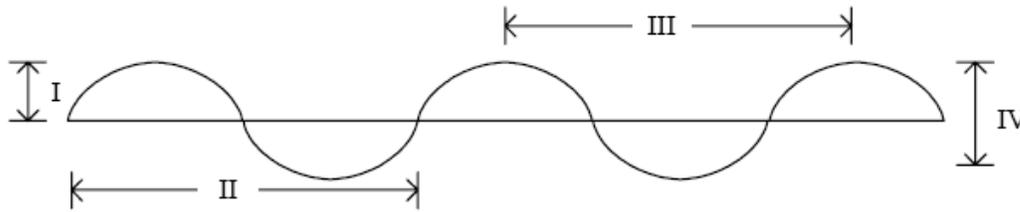
8. According to Ohm's Law, the current running through a conductor is

- A. inversely proportional to the voltage.
- B. directly proportional to the resistance.
- C. a sum of the voltage and resistance.
- D. inversely proportional to the resistance.

9. A rocket lifts off due to a reaction to gas propulsion. This is an example of which law of objects in motion?

- A. Newton's 1st law
- B. Newton's 2nd law
- C. Newton's 3rd law
- D. Kepler's 2nd law

10.



The diagram above shows an instantaneous image of a wave on a string. The rest position of the string is the horizontal straight line. Which of the double-headed arrows indicates the peak-to-peak frequency of the wave?

- A. I
- B. II
- C. III
- D. IV

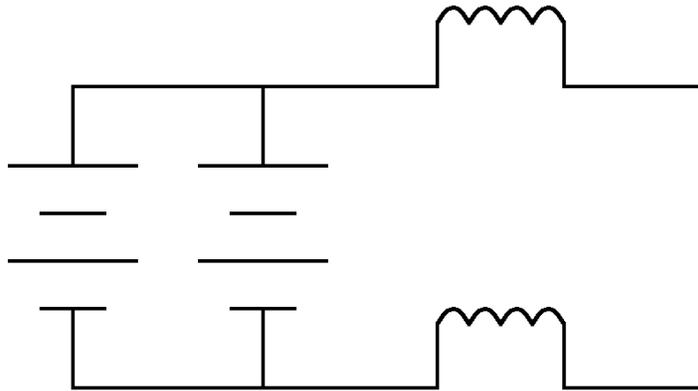
11. In a concert hall, sound waves are bent around objects. This is an example of

- A. constructive interference.
- B. destructive interference.
- C. diffraction.
- D. the Doppler effect.

12. Two balloons with opposite electrostatic charges will

- A. repel one another.
- B. attract one another.
- C. have no effect on each other.
- D. emit a spark.

13.



The wiring diagram shown above indicates that

- A. the batteries are hooked in series and the light bulbs are hooked in series.
- B. the batteries are hooked in parallel and the light bulbs are hooked in parallel.
- C. the batteries are hooked in series and the light bulbs are hooked in parallel.
- D. the batteries are hooked in parallel and the light bulbs are hooked in series.

14. The device that changes AC (alternating current) to DC (direct current) is a (an)

- A. generator.
- B. transformer.
- C. motor.
- D. rectifier.

15. Which phase change indicates that a substance gains energy?

- A. freezing
- B. deposition
- C. condensation
- D. sublimation

16. A great deal of solar radiation from the Sun enters the atmosphere and reaches Earth, while some energy is reflected back into space. This is a demonstration of

- A. conservation of energy.
- B. excess input energy.
- C. decrease in entropy.
- D. total loss of energy.

17. The combining of atomic nuclei within the Sun that releases tremendous energy is called

- A. alpha decay.
- B. beta decay.
- C. fission.
- D. fusion.

18. Which type of radiation has the highest energy?

- A. x-rays
- B. gamma rays
- C. infrared
- D. ultraviolet (UV)

19. A mirror used to enlarge the image of a person using it to put on make up is

- A. convex.
- B. concave.
- C. flat.
- D. focused.

20. What is the power drawn by a 240-volt oven that is rated for 40 amps?

- A. 0.167 joules
- B. 9,600 watts
- C. 6.0 watts
- D. 167 joules

21. It is believed that this layer of the Earth is composed mainly of liquid iron.

- A. crust
- B. mantle
- C. outer core
- D. inner core

22. The time known as the "age of dinosaurs" occurred during which geologic era?

- A. Precambrian
- B. Cenozoic
- C. Mesozoic
- D. Paleozoic

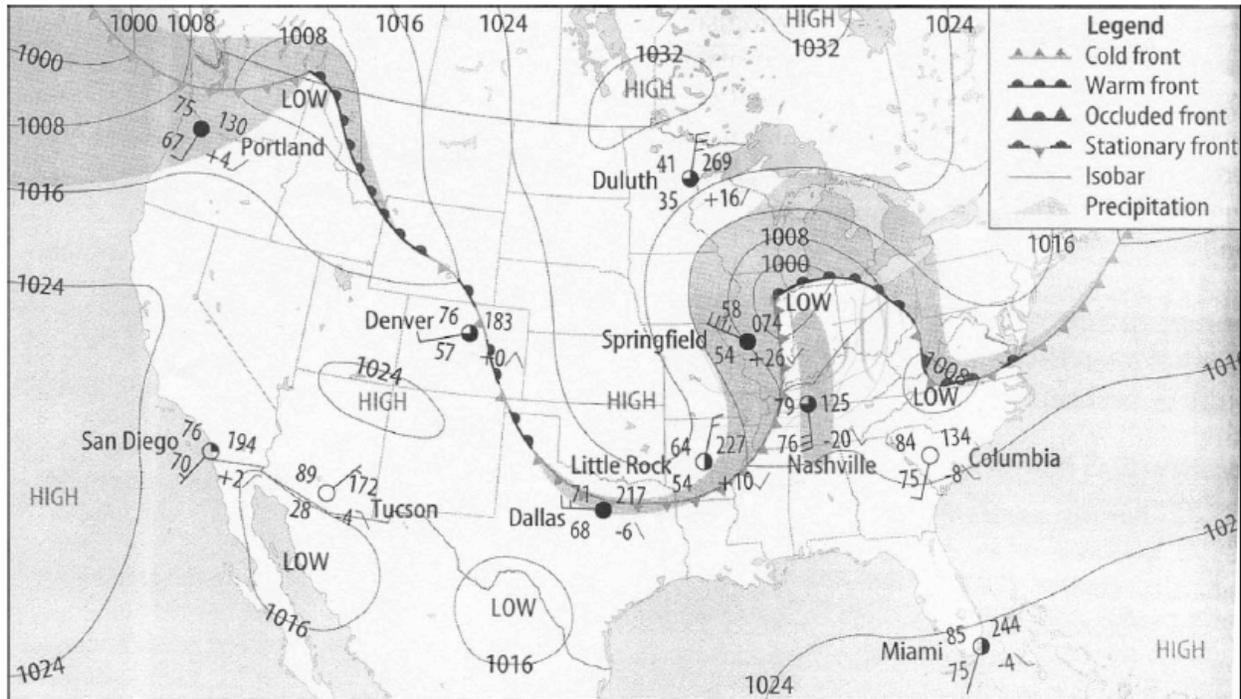
23. Compared to the inner core, the Earth's outer core is believed to be

- A. less dense and cooler.
- B. less dense and hotter.
- C. more dense and hotter.
- D. more dense and cooler.

24. Which of the following surface ocean currents is known for being slow moving and cool?

- A. California Current
- B. Brazil Current
- C. South Pacific Equatorial Current
- D. Gulf Stream

25.



According to the weather map, over the next 24 hours the weather in the northwestern United States will likely bring what conditions to Portland?

- A. dry weather and colder temperatures
- B. steady rain and colder temperatures
- C. dry weather and warmer temperatures
- D. steady rain and warmer temperatures

26. Where do oceanic ridges form?

- A. Ridges form along divergent plate boundaries.
- B. Ridges form along convergent plate boundaries.
- C. Ridges form where freshwater meets seawater.
- D. Ridges are the slopes from the continental shelf to the abyssal plain.

27. Rocks or minerals formed in the openings of existing rocks during chemical reactions are called

- A. igneous rocks.
- B. sedimentary rocks.
- C. metamorphic rocks.
- D. precipitated rocks.

28. Which mineral is lowest on the Mohs hardness scale?

- A. calcite
- B. talc
- C. diamond
- D. quartz

29. Which layer of the atmosphere do most birds fly in?

- A. stratosphere
- B. mesosphere
- C. thermosphere
- D. troposphere

30. What cloud formations are composed entirely of ice?

- A. cumulus
- B. cirrus
- C. cumulonimbus
- D. nimbostratus

31. Surface features made up of silty soil that has been deposited by windstorms are known as

- A. karst topography.
- B. dunes.
- C. loess deposits.
- D. crevasses.

32. The result of this activity has been shown to deplete ozone, allowing harmful UV rays to enter Earth's atmosphere.

- A. releasing chlorofluorocarbons
- B. overcultivating land
- C. burning fossil fuels
- D. dumping toxic wastes

33. During fall in the Northern hemisphere, the Southern hemisphere experiences

- A. summer.
- B. winter.
- C. spring.
- D. fall.

34. According to optical spectrometers, the hottest stars in the known universe are colored

- A. white.
- B. yellow.
- C. red.
- D. blue.

35. An astronomer viewing a distant star notices the star's spectral lines are shifted toward shorter wavelengths. This indicates the star is

- A. moving toward the Earth.
- B. very old.
- C. very young.
- D. moving away from the Earth.

36. A group of celestial objects found in a region located roughly between the orbits of Mars and Jupiter are

- A. asteroids.
- B. comets.
- C. meteors.
- D. Kuiper belt objects.

37. What is the name of the huge, gravitationally bound system of stars, interstellar gas and dust, plasma, and (possibly) unseen dark matter?

- A. galaxy
- B. constellation
- C. nebula
- D. comet

38. This causes the yearly seasonal changes on Earth to occur.

- A. a change in the Earth's distance from the Sun
- B. the gravitational pull of the Moon
- C. the tilt of the Earth on its axis
- D. the apparent movement of the Sun from East to West

39. The DNA of prokaryotes can be found in the

- A. flagellum.
- B. ribosomes.
- C. lysosomes.
- D. cytoplasm.

40. Which cell organelle aids in cell division?

- A. golgi apparatus
- B. centriole
- C. vacuole
- D. lysosome

41. In humans, the failure of chromosome pairs to separate properly is known as

- A. gene fusion
- B. chromosomal fusion
- C. gene dominance
- D. nondisjunction

42. What is the inheritance pattern typified by a 1:2:1 phenotype ratio?

- A. complete dominance in a dihybrid cross
- B. complete dominance in a monohybrid cross
- C. incomplete dominance in a monohybrid cross
- D. incomplete dominance in a dihybrid cross

43. A terrestrial invertebrate has been found. Its body is long, skinny, and segmented. To what phylum does it belong?

- A. Porifera
- B. Platyhelminthes
- C. Nematoda
- D. Annelida

44. What classification of protozoan uses flagella as a means of locomotion?

- A. sarcodina
- B. mastigophora
- C. cnidospora
- D. sporozoa

45. Which order of scientific classification does the animal *Canis familiaris* belong to?

- A. carnivora
- B. chordata
- C. animalia
- D. mammalia

46. In flowers, pollen is normally found

- A. on the sepals.
- B. on the anthers.
- C. on the pistils.
- D. on the filaments.

47. In human circulation, which of the following best describes the flow of blood from the heart?

- A. left ventricle, aorta, capillaries, vena cava, right atrium
- B. left atrium, pulmonary artery, vena cava, right ventricle, aorta
- C. aorta, capillaries, pulmonary artery, right ventricle, left ventricle
- D. left atrium, right atrium, capillaries, left ventricle, right ventricle

48. In human respiration, oxygen and carbon dioxide gases are exchanged in the

- A. bronchus.
- B. diaphragm.
- C. alveoli.
- D. trachea.

49. Which of the following is not part of the human endocrine system?

- A. pancreas
- B. thyroid
- C. pharynx
- D. adrenal gland

50. Which kind of behavior is illustrated in a spider's ability to spin a web?

- A. instinctive
- B. learned
- C. social
- D. territorial

51. Which of the following are all part of the water cycle?

- A. condensation, evaporation, respiration, transpiration, and precipitation
- B. evaporation, condensation, precipitation, accumulation, transpiration
- C. condensation, precipitation, accumulation, transpiration, and nitrification
- D. evaporation, condensation, precipitation, ammonification, and accumulation

52. Which of the following is not normally associated with a tundra biome?

- A. deciduous plant life
- B. cold climate
- C. short season of growth
- D. low biotic diversity

53. Which of the following would most likely be found on the surface of a decaying log?

- A. blue-green algae
- B. segmented worms
- C. termites
- D. bracket fungi

54. What does the release of insulin in the human body help it to do?

- A. stimulate oxygen absorption
- B. maintain homeostasis
- C. lower body temperature
- D. increase perspiration

55. These organisms are found at the base of the Energy Pyramid.

- A. primary consumers
- B. tertiary consumers
- C. producers
- D. aquatic organisms

56. A chemistry teacher plans to rearrange desks and have students react sulfuric acid with sugar in groups. He will obtain signed parental permission slips from students to participate in the activity. His planned activity is

- A. appropriate only if all parents have given their permission.
- B. inappropriate for students to perform regardless of parental permission.
- C. permissible so long as students are wearing appropriate eye protection.
- D. subject to approval by the science department head.

57. The appropriate piece of equipment to measure current is a(an)

- A. galvanometer.
- B. volt meter.
- C. odometer.
- D. ohm meter.

58. A solution with a pH of 11 is considered to be

- A. acidic
- B. neutral
- C. alkaline
- D. concentrated

59. Who is generally credited as one of the main discoverers of electromagnetism?

- A. Alessandro Volta
- B. James Watt
- C. Georg Ohm
- D. André-Marie Ampere

60. The teacher gives students a problem to investigate along with the materials, but not the method or expected outcomes. Students must design an experiment and figure out which data to collect and interpret to discover scientific relationships. This is an example of

- A. structured inquiry.
- B. guided inquiry.
- C. open inquiry.
- D. verification.