

ALL QUESTIONS WORTH 4 POINTS

Atomic masses: H -1; C -12; N - 14; O -16; Na - 23; S - 32, Mg - 24, Fe - 56, Cl – 35.5.

1. For the photosynthesis process, plants need:



- A) Vitamins B) Oxygen C) Light
D) Air E) Carbohydrates

2. Which organ of the digestive system contains millions of tiny-finger like projections, called villi?

- A) Mouth B) Small intestine C) Esophagus
D) Large intestine E) Stomach

3. A washing machine works on the principle of:

- A) hydraulic press B) communicating vessels
C) stationary flow D) centrifuge
E) Archimedes

4. The process which negatively affects industrial materials is:

- A) Alloying B) Rusting C) Zincing
D) Chroming E) Silvering

5. The respiratory organ in which oxygen passes from the air into the blood is:

- A) Bronchia B) Trachea C) Lung
D) Larynx E) Pharynx

6. Which of the following statements is true about the weight of bodies?

- A) It is larger at the poles than at the Equator
B) It is the same at any point on the Earth's surface
C) It is higher on the top of a mountain than at the sea level
D) It always has the direction parallel to the axis of the geographical poles
E) Its direction is always contained in the equatorial plane

7. The stoichiometric coefficients (taken in order) needed to equalize the chemical equation $\text{Hg} + \text{HNO}_3 \rightarrow \text{Hg}(\text{NO}_3)_2 + \text{NO} + \text{H}_2\text{O}$ are:

- A) 3,8,3,2,4 B) 1,3,1,1,3 C) 1,4,1,2,2
 D) 2,8,2,2,4 E) 2,6,2,2,3

8. The following process takes place during inspiration:

- A) Contraction of the diaphragm muscle
 B) Relaxation of the intercostal muscles
 C) Decrease of the chest volume
 D) Leakage of the air from the lungs
 E) Decrease of the lungs volume

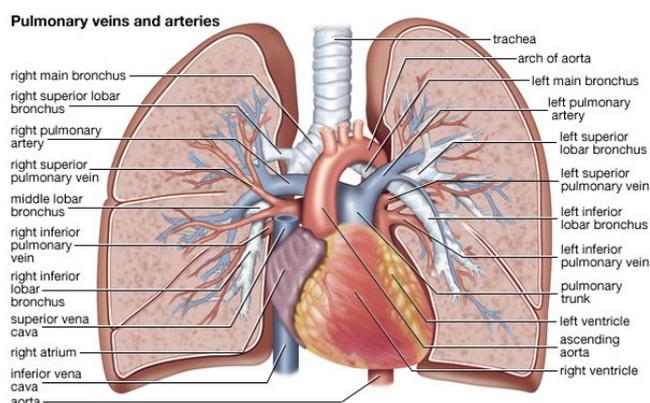
9. The virtual image of an object:

- A) is formed at the intersection of light rays and can be caught on a screen
 B) is never equal to the object
 C) is formed at the intersection of extensions of light rays and cannot be caught on a screen
 D) is always upright
 E) is always larger than the object

10. A 2.8g Fe sample is introduced in a container that has chlorine in a gaseous state (measured in normal conditions). For the reaction to be complete, the volume of the container must be at least:

- A) 1.68 cm³ B) 1.12 L C) 2.24 L
 D) 1.12 cm³ E) 1.68 L

11. The small circulation takes place between the heart and the lungs. What is the route of the blood flow?



- A) Heart => capillary => artery => veins => heart
- B) Heart => artery => veins => capillary => heart
- C) Heart => veins => capillary => veins => heart
- D) Heart => artery => capillary => veins => heart
- E) Heart => capillary => veins => artery => heart

12. Which of the following is not a unit of measurement for pressure:

- A) Torr
- B) Pascal
- C) Standard atmosphere
- D) bar
- E) Watt

13. Which of the following is a white crystalline solid that has a beautiful shine and can crumble and conduct electricity when it is dissolved in water?



- A) Diamond
- B) Quartz
- C) Table salt
- D) Gypsum
- E) Chalk

14. Choose the correct statement about the normal functioning of the heart.

- A) It contains a muscle that pumps blood from the atria into the body
- B) It receives blood through the arteries that open into the ventricles
- C) Coronary arteries bring blood to the heart with carbon dioxide
- D) The heart contracts less than 60 times per minute during physical activity
- E) It receives blood through the veins that open into the atria

15. The pair of values (3.5V ; 0.2A) is written on a flashlight bulb. These values represent:

- A) the electromotive force and the resistance of the battery to be used to power the flashlight
- B) the nominal parameters of the bulb: supply voltage and current
- C) the energy consumed by the bulb if the indicated current will pass through it
- D) the supported voltage and electrical resistance of the bulb
- E) the electromotive force and the current delivered by the flashlight's battery

16. Which of the following is a physical phenomenon?

- A) Copper corrosion
- B) Milk spoiling
- C) Turning grape juice into vinegar
- D) Pressing olives
- E) Rancidification of fats

17. Which of the following is a biotic factor in the terrestrial ecosystem?

- A) the air temperature
- B) the snow leopard
- C) the geographical position
- D) the wind speed
- E) the volcanic eruption

18. A fisherman and a diver, who works at a small depth in the sea, are at the same distance from the ship on which an explosion occurred. Who will hear the sound of the explosion first?

- A) They will hear the explosion at the same time, because they are at the same distance from the ship
- B) The diver will hear the explosion first, because the speed of sound is higher in the water than in the air
- C) The fisherman will hear the explosion first, because the speed of sound is higher in the air
- D) The fisherman is the only one who hears the explosion because the sounds do not propagate in the water
- E) The sound of the explosion is very loud, that is why it is perceived simultaneously by the fisherman and the diver

19. Sugar can be dissolved in:



- A) Vinegar
- B) Oil
- C) Gasoline
- D) Carbon disulfide
- E) Chlorophorm

20. Which of the following vertebrates have a constant temperature, regardless of the ambient temperature?

- A) Snake and lizard
- B) Frog and turtle
- C) Camel and crocodile
- D) Penguin and dolphin
- E) Rabbit and salmon

21. Which of the following is not a fundamental unit of measurement (S.I.)?

- A) second
- B) volt
- C) ampere
- D) meter
- E) kelvin

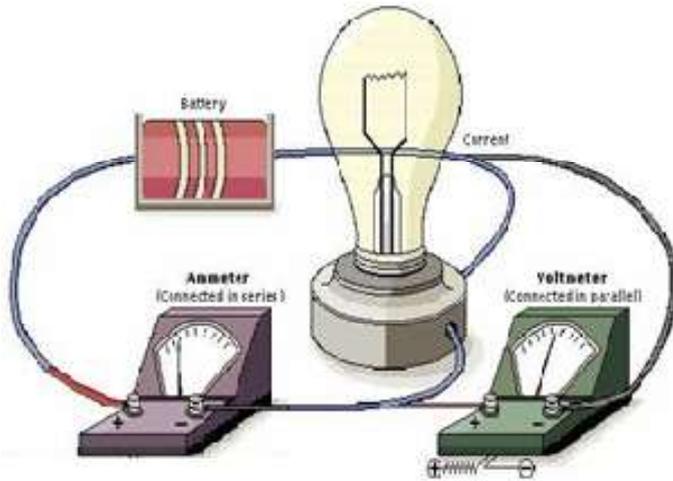
22. In order to separate a mix of water, powdered sugar and oil, we will proceed with the following operations in order:

- A) Crystalization, separation with a separation funnel
- B) Filtration, crystalization
- C) Distilation, crystalization
- D) Separation with a separation funnel, crystalization
- E) Separation with a separation funnel, distilation

23. Which of the following statements about the spinal cord is false?



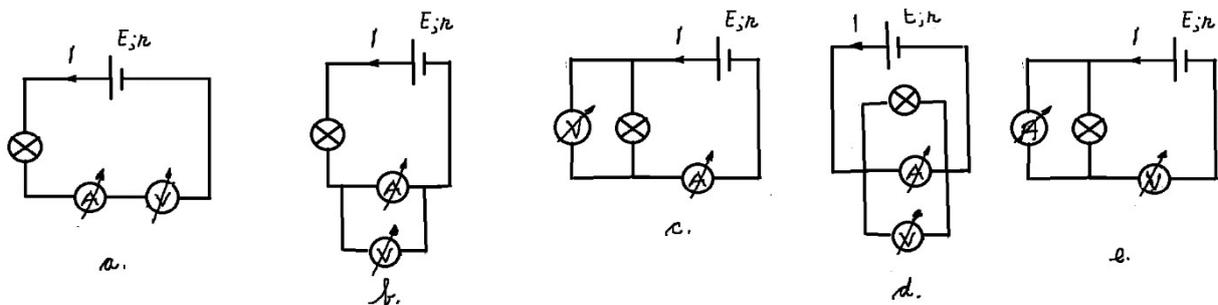
- A) It sends information to receivers
- B) It contains gray matter inside
- C) It is part of the central nervous system
- D) It contains some centers of involuntary reflexes
- E) It is connected to the periphery by the spinal nerves



24.

Figure 1

Which of the following shows the schematic diagram for the electrical circuit from Figure 1?



A) a

B) b

C) c

D) d

E) e

25. Which of the following are sources of renewable energy?



A) Natural gas



B) Petroleum



C) Graphite



D) Coal



E) Tides

26. Choose the correct pathway of the urine in our body, from the place of formation to the place of elimination:

- A) kidneys -> urethra -> bladder -> ureters
- B) kidneys -> ureters -> urethra -> bladder
- C) urethra -> ureters -> kidneys -> bladder
- D) bladder -> kidneys -> urethra -> ureters
- E) kidneys -> ureters -> bladder -> urethra

27. When a wave travels through a medium:

- A) the energy is transferred from one place to the other
- B) the speed of wave is the same in different mediums
- C) the particles of medium are transferred from one place to the other
- D) the amplitude is the same in different mediums
- E) the wave length does not depend on the medium through which it passes

28. A 2.4g magnesium sample is burned in oxygen, resulting 4g of magnesium oxide. The amount of consumed oxygen is:

- A) Equal to the amount of magnesium that was introduced
- B) 4g
- C) 1.6g
- D) 2g
- E) 2.6g

29. Choose the correct statement about heredity:



- A) It represents the characteristic of individuals to differ from each other
- B) It is provided by mutations in the genetic material
- C) It represents the transmission of characteristics from parents to descendants
- D) All human characters are hereditary
- E) It represents the transmission of characteristics from parents to grandparents

30. The experiment shown in the image below highlights the phenomenon of:



- A) Refraction
- D) Diffusion

- B) Reflection
- E) Convection

- C) Dispersion

