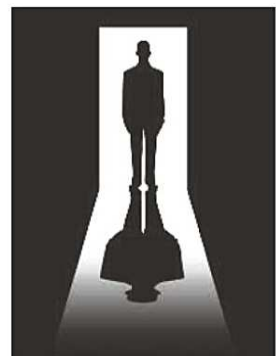


All questions worth 4 points.

1. The apple and the rose have the following common features:



- A) Have the seed with a cotyledon
  - B) Use the oxygen to produce food
  - C) The fruit is formed from the ovule
  - D) They have petals that attract insects
  - E) They have chloroplasts in the root cells
2. Which of the following statements about the states of matter is true?
- A) Liquids have fixed shape
  - B) There are strong repulsive forces between the particles of solid substances
  - C) The particles of liquid substances are very close to each other and they are arranged in order
  - D) Gases have no fixed shape and no fixed volume
  - E) Liquids can be compressed easily
3. Select the false statement about photosynthesis:
- A) It represents the feeding mode of Euglena and Spirogyra
  - B) It is at the base of ecosystems because it produces nutrients
  - C) It takes place in the chloroplasts of the plant cell
  - D) It takes place in the body of the field mushroom
  - E) The produced substances are stored in vacuoles
4. The shadow of an object:
- A) resembles the object in shape
  - B) is always equal to the size of the object
  - C) is bigger in size than the object when light source is far away from the object
  - D) is a region of light behind an opaque object
  - E) is a region of darkness behind a transparent object



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5. Through photosynthesis we get useful substances and commodities for human consumption. Select the right association between plant organs and their utility:

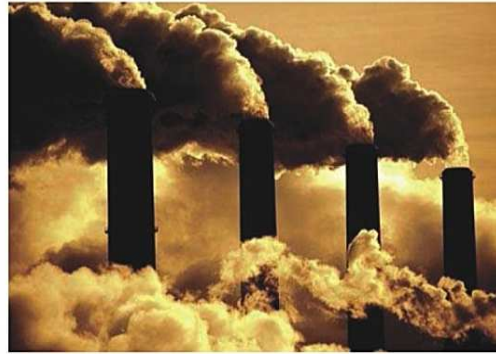
- A) Potato fruit - human nutrition
- C) Leaves of dog rose - medicinal plants
- E) Fern flowers - decorative plant

- B) Flax stem - textile fibers
- D) Leaves of cauliflower - human food

6. Which of the following is a non-renewable energy resource?



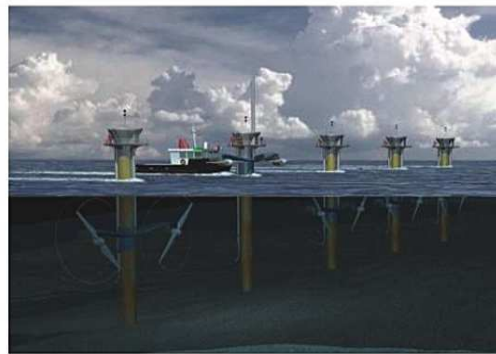
A) wind energy



B) fossil fuels energy



C) solar energy



D) tidal energy



E) hydro-electric energy

7. The unicellular green alga that has a flagellum and feeds only through photosynthesis is:

- A) Chlorococcum
- D) Chlamydomonas

- B) Amoeba
- E) Spirogyra

- C) Volvox

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8. If we want to see over a wall, we use a:

- A) telescope
- B) kaleidoscope
- C) magnifying glass
- D) periscope
- E) microscope

9. In the body of which of the following organisms do both photosynthesis and breathing take place?

- A) The orchid and the green-blue mold
- B) The mushroom and the reindeer lichen
- C) The tulip and the silver fir
- D) The white mold and the apple
- E) The orange tree and the Amoeba

10. Which group is unable to hear each other?



A) two astronauts on the Moon



B) a group of children in an open room



C) a group of dolphins in Ocean



D) a group of birds in a forest



E) a group of tourists at the North Pole

11. The plant with sexual multiplication, whose reproductive organs are represented by flower and seed, but does not have fruit is:

- A) Fern
- B) Pine
- C) Bean
- D) Wheat
- E) Lichen

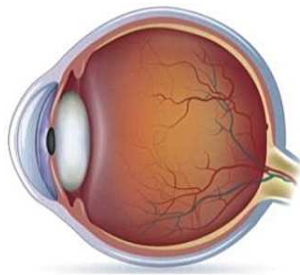
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12. A rectangular sheet of aluminium foil is heated. As a result of that:
- A) it changes its shape                      B) its density increases                      C) its size increases  
D) it changes its mass                      E) its inertia increases
13. The animal that has a poorly developed circulatory system, but has on its body air-carrying canals, is:
- A) Butterfly                                      B) Spider                                      C) Crab  
D) Snail    E) Oyster
14. Which of the following is not an elastically deformed object?
- A) The springs of the bicycle saddle when we sit on it  
B) Human lungs during breathing  
C) A heated iron bar hit by a hammer  
D) A pole during the athlete jump  
E) The bowstring when shooting
15. The component of the eye structure through which we can clearly see objects located at different distances, is:



- A) Choroid                                      B) Cornea                                      C) Iris  
D) Pupil    E) Lens
16. About the process of electrical charging by conduction, we can say that:
- A) It occurs when a body is brought in contact with a textile material  
B) It occurs when a neutral body is brought in contact with another charged body  
C) It causes the electrification of the objects brought in contact with different electrical charges  
D) It causes the repelling of two bodies, one neutral and the other electrically charged, which are brought in contact  
E) It causes the electrification of the neutral body and the neutralization of the one initially charged

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17. In which of the following groups of vertebrate animals the reproduction is performed in aquatic medium although the adult is adapted to the terrestrial environment:



A) Carp



B) Frog



C) Snake



D) Crab



E) Rabbit

18. If the light emitted by the Sun reaches Earth after 8 *min* 18*s* and the light propagation speed is 300,000 *km / s*, what is the Sun-Earth distance?

A)  $25.59 \cdot 10^5 \text{ km}$

B)  $14.94 \cdot 10^{10} \text{ m}$

C)  $24.54 \cdot 10^5 \text{ m}$

D)  $0.415 \cdot 10^{10} \text{ m}$

E)  $1.494 \cdot 10^{10} \text{ km}$

19. Which of the following organisms have the ability to perceive light and move to the light source:

A) Euglena and Chlamydomonas

B) Euglena and Spirogyra

C) Amoeba and Volvox

D) Cabbage and fir tree

E) Mimosa and Paramecium

20. Two nails *A* and *B*, placed side by side, attract each other. Choose the false statement:

A) Both nails are magnetized

B) Nail *A* is magnetized, but nail *B* is not

C) Nail *B* is magnetized, but nail *A* is not

D) No nail is magnetized

E) The two nails are traversed by electric current

21. Select the right association between the parts of plants and the movements they can make:

A) The pea root – Photonasty

B) The carnivorous plant - Seismonasty

C) Bean leaves – Geonasty

D) Amoeba cells - Seismonasty

E) Chlorococcum cell - Photonasty

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22. At the same time, three moving objects pass through town A: a car with a constant speed  $v_1 = 20\text{ m/s}$ , a motorcycle with a constant speed  $v_2 = 72\text{ km/h}$  and a train with a constant speed  $v_3 = 12000\text{ dm/min}$ . In what order will the objects arrive in town B?
- A) Simultaneously  
B) the car, the motorcycle, the train  
C) the car, the train, the motorcycle  
D) the train, the motorcycle, the car  
E) the motorcycle, the car, the train
23. Andrei hears the sound waves emitted by his brother. Which of the followings describe the path of the sounds?
- A) Ear canal - ear drum - ear ossicles - oval - cochlea  
B) Ear canal - ear drum - ear ossicles - Eustachian tube  
C) Ear drum - ear canal - ear ossicles - cochlea  
D) Ear canal - ear drum - ear ossicles - semicircular canals  
E) Ear drum - ear ossicles - ear canal - semicircular canals
24. Which of the following statements is not true about the mass of a body?
- A) It is a fundamental physical quantity  
B) It is a measure of body inertia  
C) It is measured in  $kg$   
D) It is the same as the weight of the body  
E) It can be measured with a balance
25. The sebaceous and sweat glands share the following characteristic:
- A) They leave their secretion at the surface of the skin  
B) They are in the dermis  
C) They are skin appendages  
D) They are in the hypoderm  
E) They are at the base of the hair
26. If a body hangs from a spring, then:
- A) the greater the mass of the body is, the lower elastic constant is  
B) the number of coils increases  
C) the spring elongates  
D) the spring expands  
E) The density of the material from which the spring is made is changed



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27. The sense organs contain receptors that perceive environmental changes. Establish the wrong association between the receptors and their positioning:
- A) hearing receptors - Eustachian tube
  - B) equilibrium receptors - semicircular canals
  - C) olfactory receptors - the olfactory mucosa
  - D) taste receptors – taste buds
  - E) pain receptors - tongue mucosa
28. When two highly oppositely charged clouds collide:
- A) Nothing happens
  - B) A flash of light appears before a thunder sound is produced
  - C) A thunder sound is produced before a flash of light appears
  - D) The flash of light will be reflected by the cloud
  - E) The thunder sound can't be heard on Earth
29. Select the correct statement about the cell from the given image:
- A) It is found in rhinoceros, snail and whale
  - B) The component in the center of the cell stores mineral substances
  - C) It is found in the orchid leaf and lemon leaf
  - D) In the center of the cell there is the coordinating component
  - E) It is found in the tulip bulb and the potato tuber
30. We have an aluminium body  $B$  with an inner cavity. The density of aluminium is  $2700 \text{ kg/m}^3$ . What can be the maximum volume of the inner cavity, so that when filled with a liquid of density  $700 \text{ kg/m}^3$ , the body  $B$  can be immersed in water?
- A) 70% of the volume of  $B$
  - B) 15% of the volume of  $B$
  - C) 85% of the volume of  $B$
  - D) 30% of the volume of  $B$
  - E) 24.33% of the volume of  $B$

