

ALL QUESTIONS WORTH 4 POINTS

1. Which of the following processes is reversible?

- A) fruits ripening B) ice melting C) milk fermentation
D) iron rusting E) coal burning

2. Select the correct statement about germs:

- A) The acid from the gastric juice helps to kill the germs from the food
B) The bacteria from the small intestine can cause constipation
C) All humans have parasitic bacteria in their large intestine
D) Saliva contains enzymes that destroy bacteria
E) The bacteria from the lungs can cause cancer

3. A generator converts:

- A) Mechanical energy into electrical energy
B) Electrical energy into mechanical energy
C) Heat energy into mechanical energy
D) Electrical energy into heat energy
E) Nuclear energy into heat energy

4. By reaction of an acid with a base, we obtain:

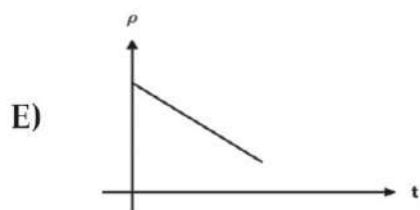
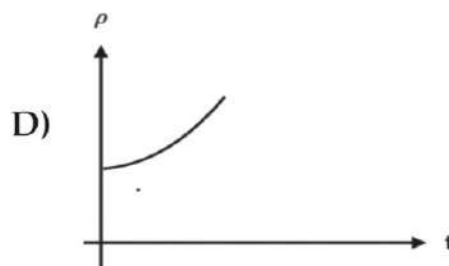
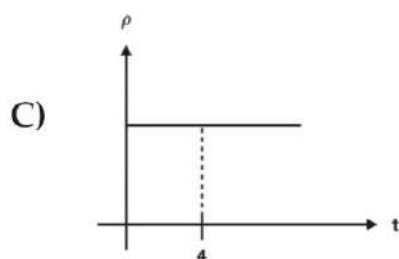
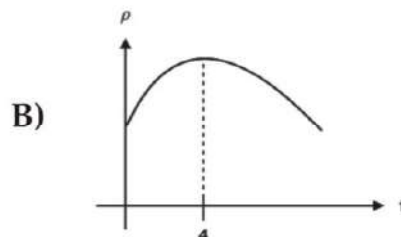
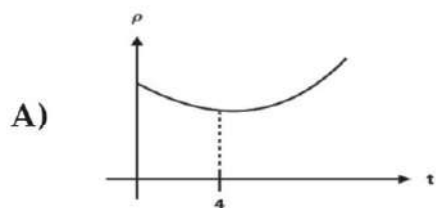
- A) metal B) oxide C) nonmetal
D) salt E) gas

5. When we breathe, the air passes through the airways to the lungs. The path of inhaled air is the following:

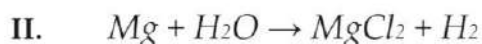
- A) Nasal cavity - larynx - pharynx - trachea - bronchus - lung
B) Nasal cavity - larynx - pharynx - bronchus - trachea - lung
C) Nasal cavity - pharynx - larynx - trachea - bronchus - lung
D) Nasal cavity - pharynx - larynx - bronchus - trachea - lung
E) Nasal cavity - larynx - trachea - pharynx - bronchus-lung



6. Which of the following graphs represents the variation of the density of water with the temperature?



7. Which of the following reactions



will evolve a gas?

A) I

B) I, II

C) II, III

D) III

E) II

8. During the winter, when it is cloudy, it is less cold than when the sky is clear because:

A) The water in the clouds freezes and releases heat

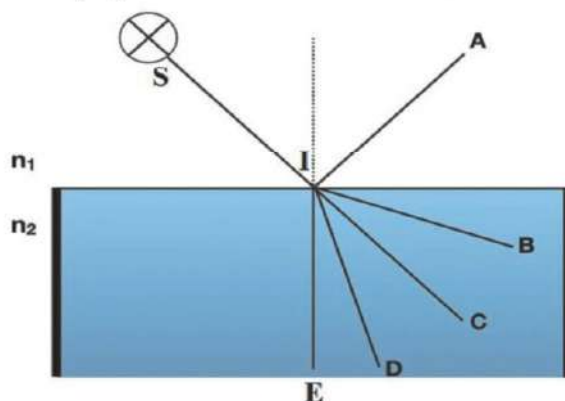
B) Clouds play a role as a thermal insulator, preventing the heat from spreading to the upper layers of the atmosphere

C) The heat emitted by the sun is reflected by clouds

D) The heat emitted by the sun is used to evaporate water from the clouds

E) Due to the thermal agitation, the potential energy of the clouds is high, and thus it heats the air

9. The next image shows the trajectory of a light beam SI to the separation surface between air (n_1) and water (n_2). The refraction radius is:



- A) IA B) IB C) IC
 D) ID E) IE
10. Which of the following reactions
- I. $NaOH + HCl \rightarrow NaCl + H_2O$
 II. $Mg + H_2O \rightarrow MgCl_2 + H_2$
 III. $CuSO_4 + 2NaOH \rightarrow Cu(OH)_2 + Na_2SO_4$
 will form a precipitate?
- A) I B) I, II C) II, III
 D) III E) II
11. Select the correct statement, on fir-tree reproduction:

- A) Pollination is done by insects
 B) Male cones contain pollen-sacs
 C) Female cones contain ovaries
 D) After the pollination the fruit is formed
 E) Flowers have sepals and petals



12. By "light-year" we mean:
- A) the colour of light one year after its emission
 B) that the light source emits the light continuously for one year
 C) a year with more sunny days than cloudy days
 D) the distance that light travels in one year
 E) the amount of light emitted by a source in one year

13. The substance that can sublime is:



A) Naphthalene

B) Ice

C) Sulfur

D) Salt

E) Sugar

14. Seeds store reserves.

Select the correct statement about the seeds of the plants and the reserve substances that predominate:



A) Bean-sugars

B) Sunflower-proteins

C) Wheat-fats

D) Walnut- sugars

E) Rice-fats

15. The bulb will illuminate when the electric current passes through the filament:

A) because the gas inside begins to burn

B) due to the heating of the filament at very high temperatures

C) only if the filament has a very low melting temperature

D) only if the filament is a very good insulator

E) even if the electric current does not pass through the circuit where the bulb is connected

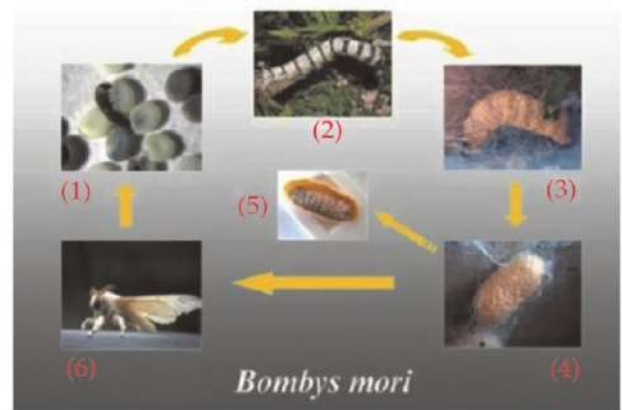
16. The image below suggests:



- A) an intense water loss
- B) the air pollution by the emanations of toxic gases
- C) the fact that chimneys emit smoke that does not pollute
- D) the pollutants are solid
- E) it's a cloudy day

17. Insects develop through metamorphosis, a process of transformation from an immature form (eggs) to an adult form in some intermediate stages. Which stage does the image number 3 represent in the diagram?

- A) Egg
- B) Larva
- C) Pupa
- D) Adult
- E) Nimfa



18. If we add a drop of ink in a glass of water, the water will be uniformly coloured in blue after a while. About this phenomenon we can say that:

- A) It is called dispersion
- B) It is reversible
- C) It is called diffusion
- D) The colder the water is, the faster it occurs
- E) It is called absorption

19. A part of a gray metal plate turns into a reddish, crumbly substance. The metal from which the plate is made is:

- A) copper
- B) magnesium
- C) aluminum
- D) iron
- E) mercury

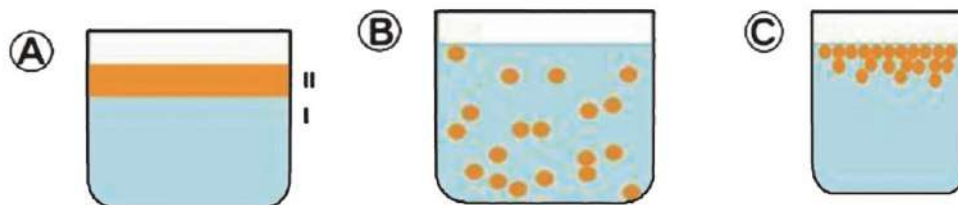
20. Andrei studies the organs of an animal and puts into a bowl with water a piece of muscle and a piece of lung. The result obtained by Andrei is the following:

- A) Both organs rise to the surface of the bowl
- B) Lung rises to the surface of the bowl
- C) Muscle rises to the surface of the bowl
- D) The lung remains at the bottom of the bowl
- E) Both organs remain at the base of the vessel

21. Regarding the evaporation it is not true that:

- A) It takes place at any temperature
- B) It is not the same thing as boiling
- C) It is produced faster when the free surface of the liquid is larger
- D) Under the same conditions of pressure and temperature, 10mg of water evaporate as quickly as 10mg of alcohol
- E) To produce it, the liquids absorb heat

22. The following pictures show a mixture of water and oil. Which of the following images



represents an oil in water emulsion?

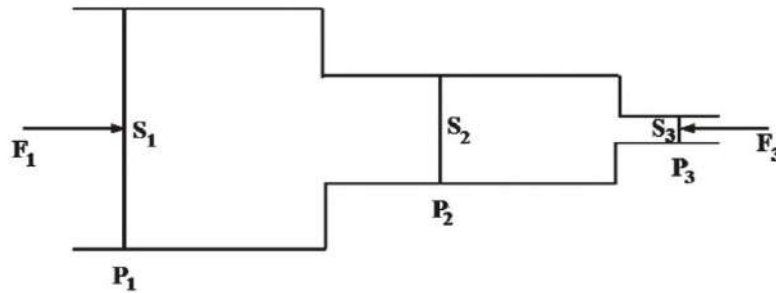
- A) A, B, C
- B) B, C
- C) A
- D) A, B
- E) B

23. On a trip to the forest Alina noticed 5 animals: a fox, a hedgehog, a salamander, a deer and a cuckoo. Which of these animals is a primary consumer?



- A) Hedgehog
- B) Salamander
- C) Fox
- D) Cuckoo
- E) Deer

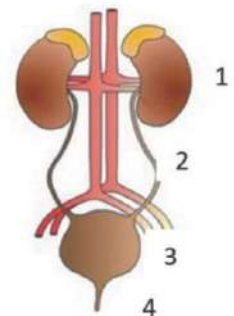
24. The following image illustrates the action of three pistons in a variable-diameter tube which cross sectional areas satisfy the relation $S_1 = 2S_2 = 4S_3$. What force must be applied to piston P_1 (see the next image) for the piston P_2 to remain in place when we apply the force F_3 on P_3 ?



- A) $F_1 = 4F_3$ B) $F_1 = F_3$ C) $F_1 = 2F_3$
 D) $4F_1 = F_3$ E) $2F_1 = F_3$
25. To balance the chemical equation $Ca_3(PO_4)_2 + H_2SO_4 \rightarrow CaSO_4 + H_3PO_4$ you have to add the following coefficient to the phosphoric acid:

- A) 5 B) 3 C) 2
 D) 1 E) 4

26. The excretory system has the role of eliminating unnecessary substances from the body. Choose the correct statement about the organ number 3:



- A) It contains millions of nephrons that produce urine
 B) It leads urine from the kidney to the bladder
 C) It always stores the urine produced by the kidneys
 D) It contains muscles that, through contraction, eliminate urine
 E) It filters the blood from the renal artery

27. After a rainy day, the barometer begins to indicate a higher pressure. Under these circumstances, we say that:



- A) It will continue to rain
 B) The weather will become sunny
 C) The barometer is not used to indicate the atmospheric pressure
 D) The dry air is lighter than the humid air
 E) The pressure remains the same

28. The gene is the basic physical and functional unit of heredity.
Select the correct statement about genes:

- A) All body characteristics are hereditary
- B) The body that has different genes is homozygous
- C) The genes instruct our bodies to make proteins
- D) The genes that determine black hair are recessive
- E) The genes are visible on the microscope during division

29. In which of the following places you cannot hear any sound?

- A) in the forest
- B) on the beach
- C) in a room with closed windows
- D) in outer space
- E) on the board of a submarine

30. Which of the following does not use ultrasound for functioning or for orientation:

- A) the sonar
- B) the ultrasound machine
- C) the dolphins
- D) the bats
- E) the seismograph

