

National Science Olympiad Competition – 2023
Provincial Level
6 / 7 Grades

Science

Time: one hour

Name:

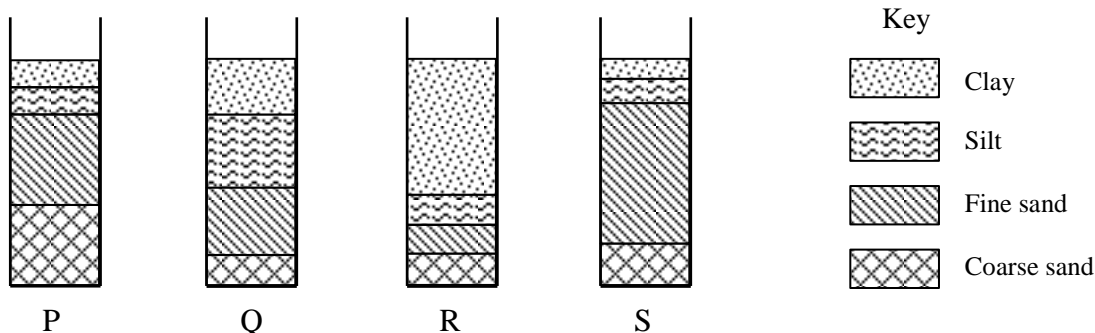
School:

Answer all the questions.

*** For multiple choice question, underline the correct or the most appropriate answer.**

*** For short – answer questions, write your answer briefly on the space provided.**

01. Out of those given below, what is **not** a unit of measuring acceleration?
(a). ms^{-2} (b). cm s^{-2} (c). km s^{-2} (d). km h^{-2}
02. Out of those following components used in the domestic electric circuit, what is the component that **does not** function on the magnetic effect of electricity?
(a). Isolator (main switch). (b). Residual Current Circuit Breaker (RCCB).
(c). Distribution board containing MCBs. (d). Electric meter.
03. What is the action mentioned below, that promotes the sustainable consumption?
(a). Buying plastic bottles and containers which are disposed after using once.
(b). Using efficient paddy husk hearths for cooking food.
(c). Using paper for plates, cups and packing food instead of plastics.
(d). Increasing the consumption of non-renewable resources.
04. Out of various dimensions of sustainable development, which dimension affects mostly on conservation of natural resources and promotion of biodiversity?
(a). Economic sustainability. (b). Social sustainability.
(c). Environmental sustainability. (d). Industrial sustainability.
05. Mineral constituents of four types of soil were analyzed. Their amounts were as shown below.



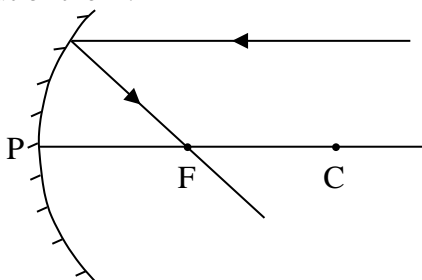
Out of these, which is the most suitable type of soil for growing crops?

- (a). P (b). Q (c). R (d). S
06. Out of following statements about applying an unbalanced force on an object, what can be the false statement?
(a). The object moves. (b). Shape of the object changes.
(c). The object rotates. (d). The amount of matter in the object changes.

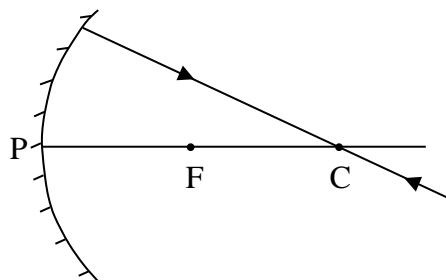
07. In which answer below, that the locomotive appendages of Clamydomonas, Amoeba and Paramecium are mentioned respectively?

- (a). Pseudopodia, flagella, cilia. (b). Flagella, cilia, pseudopodia.
(c). Cilia, flagella, pseudopodia. (d). Flagella, pseudopodia, cilia.

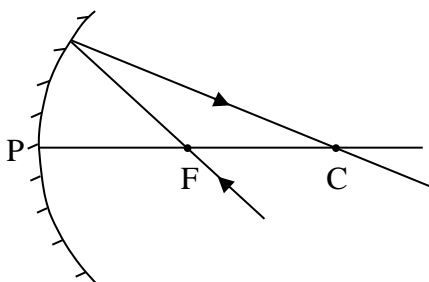
08. Shown below are four ray diagrams related to a concave mirror. What is the erroneous ray diagram out of them?



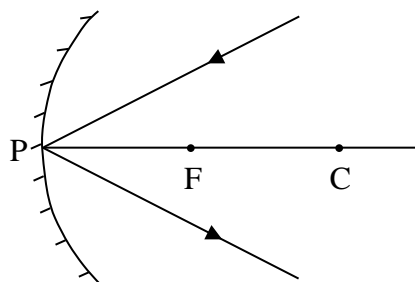
(a)



(b)



(c)



(d)

09. What is the greenish yellow gas with a pungent smell that can be used to destroy germs in drinking water?

- (a) Oxygen. (b) Ozone. (c) Chlorine. (d) Nitrogen.

10. Out of those given below, what is the most appropriate method to test whether a given sample of water is sea water?

- (a) Filtering through cotton wool. (b) Evaporating.
(c) Tasting. (d) Observing a drop of sample through microscope.

11. What is the solution mentioned below, that changes the colour distinctly when added to a salad of blue “Katurodu” flowers?

- (a) Salt solution. (b) Sugar. (c) Vinegar. (d) Water

12. In which answer below, that several organizational levels of the body of organisms are mentioned respectively?

- (a) Cell → organ → tissue → system
(b) Tissue → cell → system → organ
(c) Organ → cell → system → tissue
(d) Cell → tissue → organ → system

13. When a small amount of iodine solution was added to a sample of a mixture of food, it became blue. When few drops of copper sulphate solution were added to another sample of the mixture of food after adding sodium hydroxide solution, the medium became purple. Presence of what nutrients in the food mixture can be concluded according to the above observations?
- (a) Lipid and starch. (b) Starch and protein.
(c) Protein and reducing sugar. (d) Protein and lipid.
14. Out of those mentioned below, the animal that has a rumen as a part of stomach is the,
(a) cat. (b) cattle. (c) rat. (d) monkey.
15. What is the ocean that the change of temperature of surface water causes the phenomenon called El-nino?
(a) North Atlantic. (b) South Atlantic. (c) North Pacific. (d) South Pacific.

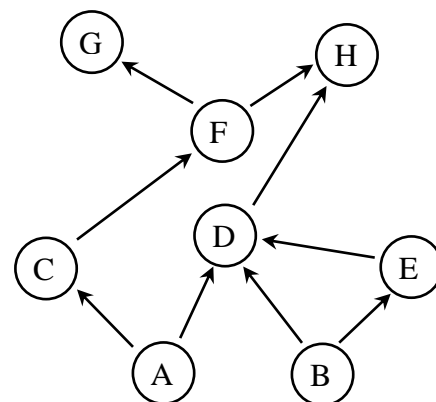
* Answer the questions 16 and 17 with relation to the following food web.

16. Which organism is the omnivore of this?

(a) C (b) D
(c) E (d) F

17. Removal of which organism from the related ecosystem, causes the greatest damage to this food web?

(a) C (b) D
(c) E (d) F



18. In which stratum of the Earth's atmosphere that the phenomena aurora borealis and aurora australis occur?
(a) Troposphere. (b) Stratosphere. (c) Mesosphere. (d) Thermosphere.
19. Density of a substance is known as the ratio of its mass to the volume.

Thus,

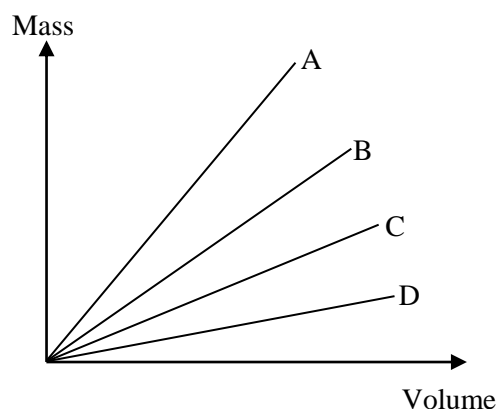
$$\text{Density} = \frac{\text{Mass}}{\text{Volume}}$$

The gradient of the graph of mass of a substance drawn versus its volume is equal to the density of that substance. The gradient increases with the increase of density and it decreases with the decrease of density.

The graph here, shows how the mass of four substances (A, B, C and D) changes according to their volumes. Density of C is 900 kg m^{-3} . The values of densities of other three substances are 800 kg m^{-3} , 1200 kg m^{-3} and 1800 kg m^{-3} randomly.

What can be densities of A and D respectively?

- (a) 800 kg m^{-3} and 1800 kg m^{-3} (b) 1200 kg m^{-3} and 800 kg m^{-3}
(c). 1800 kg m^{-3} and 800 kg m^{-3} (d). 1800 kg m^{-3} and 1200 kg m^{-3}



20. The fruits of a certain plant are very tasty. The middle part of these fruits contains a large number of small seeds with very hard seed coats. What can be the method of dispersion of these seeds, mentioned below?
- Spreading the seeds here and there by animals after eating the fruit.
 - Rubbing the seeds on the floor which are stuck on the beaks of birds when they eat the fruit.
 - Dumping the seeds here and there with the faecal matter of the birds who eat the fruits.
 - Collecting the seeds to the soil when the fruits fall on the ground and their fleshy parts are decayed.
21. What is the property of water related to each instance given below?
- A wet tiled floor being slippery.
.....
 - Water being put into vehicle radiators.
.....
 - Washing dry fish several times with water to remove salt in it.
.....
22. What are the three principal mineral acids in the school laboratory?
- *
 - *
 - *
23. The leaves of a certain plant are thin and long. Their veins are located parallelly. What is the type of root system of the plant?
.....
24. What is the term used for the adaptation shown by the “leaf insect”, sometimes found on lime plants?
.....
25. Out of the following, what can be used to obtain a converging light beam and a diverging light beam from a parallel light beam?

Plane mirror, Convex mirror, Concave lens, Convex lens, Prism.

- Converging light beam:
 - Diverging light beam:
26. There are a soft iron rod and a steel rod which are equal in external appearance. Additionally, an insulated copper wire to the length of about 1 m, a 3 V battery and enough number of pins are provided. Clarify briefly how the soft iron rod and the steel rod are identified separately using those provided.
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27. When cooking a type of hard meat, slices of raw papaw are added to soften it. Clarify briefly the reason for this.

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28. In lagoons, there is a type of roots of some mangrove plants growing vertically up from the swamp.

(i) What is the term used for this type of roots?

.....

(ii) Mention the function of them.

.....

29. Name the two main systems of a plant and mention two organs of each of them.

(i) System:

Organs: (a) –

(b) –

(ii) System:

Organs: (a) –

(b) –

30. When a solar water heater is installed on the roof of a house, water tank is positioned at a higher level than the coiled pipe. The coiled pipe and the tray on which it is laid are painted black.

Accordingly, give reasons for each of the following.

(i) The coiled pipe and the tray being painted black.

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(ii) Positioning the water tank at a higher level than the coiled pipe.

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