

National Science Olympiad Competition – 2023

Provincial Level

Science

8 / 9 Grades

Time : one hour

Name:

School:

Answer all the questions.

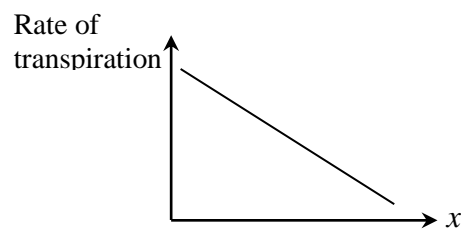
* For multiple choice questions, underline the correct or the most appropriate answer.

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

01. In a certain instance, a bullet released from a gun took 1 ms to travel a distance of 1 m. What is the speed of the bullet at that instance?
(a). 1000 m s^{-1} (b). 100 m s^{-1} (c). 10 m s^{-1} (d). 1 m s^{-1}
02. When a small amount of concentrated nitric acid, applied on the palm was about to be washed off, the palm was observed to be turned yellow. What is the substance in the skin of the palm, that caused this observation?
(a). Polysaccharide. (b). Protein. (c). Lipid. (d). Disaccharide.
03. A liquid at the temperature of 30°C was heated to 80°C . What was this temperature rise in Kelvin?
(a). 50°K (b). 50 K (c). 323°K (d). 323 K
04. The most probable type of rocks formed round the crater of a volcano is,
(a). Intrusive igneous rocks. (b). Extrusive igneous rocks.
(c). Sedimentary rocks. (d). Metamorphic rocks.
05. What is the method mentioned below, that a plant species can be conserved successfully?
(a). By preserving the parts of that plant species in a herbarium.
(b). By declaring the natural habitats of that species as natural reserves.
(c). By growing that plant species in botanical gardens.
(d). By depositing the seeds and fruits of that plant species in seed bank.
06. A sharp edged shadow without a penumbra can be obtained by using,
(a). an extended light source and an opaque object.
(b). a point light source and an opaque object.
(c). an extended light source and a translucent object.
(d). a point light source and a translucent object.
07. What is the true statement below on simple machines?
(a). Always load is greater than effort.
(b). Always the distance travelled by load is less than the distance travelled by effort.
(c). Always it can be used to make a job easy.
(d). Always mechanical advantage is greater than the velocity ratio.

08. A dicotyledonous plant dies after a short time, when it is ring barked round the main stem. Removal of what tissue in that area is the cause for this?
- (a). Phloem. (b). Xylem. (c). Epidermis. (d). Cambium.
09. An organism that has a hydrostatic skeleton for support is,
- (a). house fly. (b). centipede. (c). earth worm. (d). gecko.
10. What is the correct statement about the cones of retina?
- (a). More sensitive to white light and are abundant in the region of yellow spot.
(b). More sensitive to coloured light and are abundant in the peripheral area.
(c). More sensitive to white light and are abundant in the peripheral area.
(d). More sensitive to coloured light and are abundant in the region of yellow spot.
11. As a result of an accident to the head, a person could not maintain the balance of his body. What can be the part of his brain damaged by the accident?
- (a). Cerebrum. (b). Cerebellum. (c). Medulla oblongata. (d). Spinal cord.
12. What is the hetero-triatomic gaseous compound at room temperature, out of those given below?
- (a). O₃ (b). H₂O (c). CO₃ (d). NH₃
13. Electron configuration of an element symbolized by X is 2, 8, 6. Out of those given below, what is the false statement on this element?
- (a). X is positioned in the period 3 and group VI of the periodic table.
(b). X forms ionic bonds as well as covalent bonds.
(c). Valency of X is .2
(d). X shows metallic properties as well as non-metallic properties.
14. A soda water bottle which was cooled and another one which was in normal environment were opened. After opening, gas bubbles started to liberate faster from the bottle kept in normal environment. The reason for this is, that the solubility of a gas,
- (a). increases with the increase of temperature. (b). decreases with the increase of temperature.
(c). increases with the increase of pressure. (d). decreases with the increase of pressure.
15. On an exploration trip, a group of students came across a rock embedded with shells on the top of a hill in the middle part of country. What can be the type of that rock, mentioned below?
- (a). Sedimentary rock formed at the sea bed.
(b). Igneous rock formed at the sea bed.
(c). Metamorphic rock formed on the top of the hill.
(d). Sedimentary rock formed at the foot of the hill.
16. Out of those mentioned below, what is the correct statement about the flow of material and the flow of energy in an ecosystem?
- (a). Energy as well as material cycles.
(b). Energy as well as material flows unidirectionally.
(c). Energy flows unidirectionally while material cycles.
(d). Energy cycles while material flows unidirectionally.

17. The graph here shows how the rate of transpiration of a plant changes with a certain environmental condition. Out of those mentioned below, what can be the environmental condition denoted on the x -axis of the graph?



- (a). Temperature. (b). Humidity of air.
 (c). Wind speed. (d). Intensity of light.

18. A student wanted to measure the rate of photosynthesis of an aquatic plant, with respect to the light intensity given. What is the measurement mentioned below, that can be practically used for this?

- (a). Rate of production of glucose in the leaves. (b). Rate of absorption of CO_2 into the leaves.
 (c). Rate of absorption of water into the leaves. (d). Rate of evolving air bubbles from the leaves.

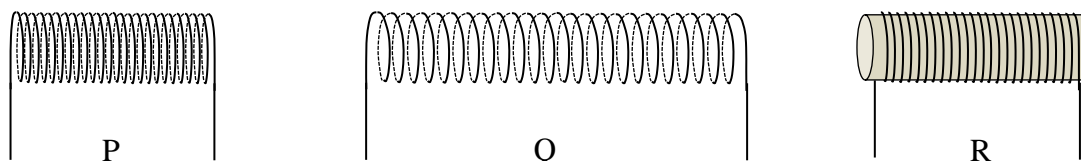
19. The leaves of a plant part preserved in the laboratory are modified to spines. The stem is fleshy and green. There is a thick cuticle. What can be the environment that, this plant can be found abundantly?

- (a). Ever-green rain forest. (b). Arid zonal thicket.
 (c). Sea shore. (d). Forest in intermediate zone.

20. What is the only wetland city in Sri Lanka declared under Ramsar convention?

- (a). Polonnaruwa. (b). Anuradhapura. (c). Colombo. (d). Batticaloa.

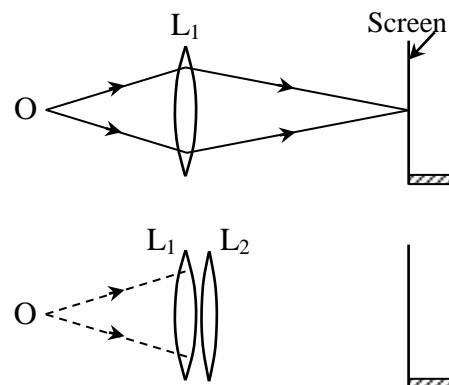
21. Figures P, Q and R show three coils made of insulated copper wire. Cross sectional area and the number of turns of them are equal. There is a soft iron core in the middle of the coil R.



In which answer below, that the coils are arranged in the ascending order of the strength of their magnetic fields induced, when equal electric currents are sent through their?

- (a). P, Q, R (b). P, R, Q (c). Q, P, R (d). Q, R, P

22. As shown in the figure, an image of O is formed on the screen by the lens L_1 . Consider the following statements on what should be done to form the image on the screen, when another convex lens L_2 , is placed in front of lens L_1 as shown in the figure below.



- (A) The screen should be shifted towards the combination of lens.
 (B) The screen should be shifted away from the combination of lens.
 (C) A suitable concave lens should be kept between the screen and the lenses.

The true statement above is,

- (a) Only A. (b) Only B. (c) Only A and B. (d) Only B and C.

23. Microwaves of the electromagnetic spectrum are between,
 (a). radio waves and infrared rays. (b). infrared rays and ultraviolet rays.
 (c). ultraviolet rays and X-rays. (d). X-rays and γ -rays.
24. What is the physical state that matter occurs in the sun?
 (a). Solid. (b). Liquid. (c). Gas. (d). Plasma.
25. When the hand is held above fire, the warmth is felt by means of,
 (a). convection. (b). radiation. (c). conduction and radiation. (d). Convection and radiation.

Write the answers for question 26 to 30 on the dotted line given.

26. A student tried to find the geographical north by placing a magnetic compass horizontally on his mineral box. But he realized that the compass does not show the north direction. What can be the reason for this?

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27. A piece of white cloth soaked in ammonia solution mixed with phenolphthalein is pink in colour. When it is stretched and hung for some time, it turns back to white. Clarify reasons for this observation.

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28. (i) What is the term used for the phenomenon of having morphologically different stages in the life cycle of an organic species?

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(ii) Write two advantages that the said organic species acquire because of the phenomenon you mentioned above.

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29. Mention a phenomenon that occurs on the Earth, because of the tilt of (23.5°) Earth's axis from the normal to the orbital plane of the Earth.

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30. Mention two main differences between the two processes of transpiration and guttation of plants.

(i)

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(ii)

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