

**Q11. Which of the following does not convert electrical energy into light energy?**

- (a) A candle
- (b) A light-emitting diode
- (c) A laser
- (d) A television set

**Q12. Which of the following is/are the main absorbing organ/organs of plants?**

- (a) Root only
- (b) Leaf only
- (c) Root and leaf only
- (d) Root, leaf and bark

**Q13. Which of the following is not a primary function of a green leaf?**

- (a) Manufacture of food
- (b) Interchange of gases
- (c) Evaporation of water
- (d) Conduction of food and water

**Q14. Which one of the following denotes a 'true' fruit?**

- (a) When only the thalamus of the flower grows and develops into a fruit
- (b) When only the receptacle of the flower develops into a fruit
- (c) When fruit originates only from the calyx of a flower
- (d) When only the ovary of the flower grows into a fruit

**Q15. In which one of the following physiological processes, excess water escapes in the form of droplets from a plant?**

- (a) Transpiration
- (b) Guttation
- (c) Secretion
- (d) Excretion

**Q16. If the xylem of a plant is mechanically blocked, which of the following functions of the plant will be affected?**

- (a) Transport of water only
- (b) Transport of water and solutes
- (c) Transport of solutes only
- (d) Transport of gases

**Q17. Which one of the following agents does not contribute to propagation of plants through seed dispersal?**

- (a) Wind
- (b) Fungus
- (c) Animal
- (d) Water

**Q18. The visible portion of the electromagnetic spectrum is**

- (a) infrared
- (b) radiowave
- (c) microwave
- (d) light

**Q19. Which one of the following is the correct ascending sequence of States in terms of their population density as per Census 2011?**

- (a) Arunachal Pradesh—Sikkim—Mizoram—Himachal Pradesh
- (b) Arunachal Pradesh—Mizoram—Sikkim—Himachal Pradesh
- (c) Mizoram—Arunachal Pradesh—Himachal Pradesh—Sikkim
- (d) Arunachal Pradesh—Himachal—Pradesh—Sikkim—Mizoram

**Q20. The rate of population growth during 2001—2011 decade declined over the previous decade (1991-2001) in all of the following States, except**

- (a) Tamil Nadu
- (b) Kerala
- (c) Goa
- (d) Andhra Pradesh

**Q21. Which one of the following statements with regard to growth of coral reefs is not correct?**

- (a) Coral can grow abundantly in fresh-water
- (b) It requires warm water between 23 °C—25 °C.
- (c) It requires shallow saltwater, not deeper than 50 metres.
- (d) It requires plenty of sunlight to aid photosynthesis.

**Q22. As per Census 2011, the concentration of Scheduled Caste population (going by percentage of Scheduled Caste population to total population of the State) is the highest in the State of**

- (a) Uttar Pradesh
- (b) Himachal Pradesh
- (c) Punjab
- (d) West Bengal

**Q23. Which one of the following States has more than two major ports?**

- (a) Maharashtra
- (b) West Bengal
- (c) Odisha
- (d) Tamil Nadu

**Q24. The equivalent weight of  $\text{Ba}(\text{OH})_2$  is (given, atomic weight of Ba is 137.3)**

- (a) 85.7
- (b) 137.3
- (c) 154.3
- (d) 171.3

**Q25. Which one of the following nitrogen oxides has the highest oxidation state of nitrogen?**

- (a) NO
- (b)  $\text{NO}_2$
- (c)  $\text{N}_2\text{O}$
- (d)  $\text{N}_2\text{O}_5$

**Q26. Which one of the following is not true for the form of carbon known as diamond?**

- (a) It is harder than graphite.
- (b) It contains the same percentage of carbon as graphite.
- (c) It is a better electric conductor than graphite.
- (d) It has different carbon to carbon distance in all directions.

**Q27. In which one of the following reactions, the maximum quantity of  $\text{H}_2$  gas is produced by the decomposition of 1g of compound by  $\text{H}_2\text{O}/\text{O}$ ?**

- (a)  $\text{CH}_4 + \text{H}_2\text{O} \rightarrow \text{CO} + 3\text{H}_2$
- (b)  $\text{CO} + \text{H}_2\text{O} \rightarrow \text{CO}_2 + \text{H}_2$
- (c)  $\text{CH}_4 + \frac{1}{2}\text{O}_2 \rightarrow \text{CO} + 2\text{H}_2$
- (d)  $\text{C}_{12}\text{H}_{24} + 6\text{O}_2 \rightarrow 12\text{CO} + 12\text{H}_2$

**Q28. When a convex lens produces a real image of an object, the minimum distance between the object and image is equal to**

- (a) the focal length of the convex lens
- (b) twice the focal length of the convex lens
- (c) four times the focal length of the convex lens
- (d) one half of the focal length of the convex lens

**Q29. The direction of magnetic field at any location on the earth's surface is commonly specified in terms of**

- (a) field declination
- (b) field inclination
- (c) both field declination and field inclination
- (d) horizontal component of the field

**Q30. A circuit has a fuse having a rating of 5A. What is the maximum number of 100 W - 220 V bulbs that can be safely connected in parallel in the circuit?**

- (a) 20
- (b) 15
- (c) 11
- (d) 10

## SOLUTIONS

**S11. Ans.(a)**

**Sol.** The heat from the wick melts the wax which gets absorbed in the wick and then gets burnt (which is really oxidation) to produce heat energy as well as light energy.

**S12. Ans.(c)**

**Sol.** Major Organs of most plants include roots, stems, and leaves. A root is a complex organ consisting of several types of tissue absorbing water and minerals: Thin-walled epidermal cells and root hairs are well suited to absorb water

**S13. Ans.(d)**

**Sol.** The main function of a leaf is to produce food for the plant by photosynthesis. Chlorophyll, the substance that gives plants their characteristic green colour, absorbs light energy. Conduction of food and water is the function of Xylem and phloem.

**S14. Ans.(d)**

**Sol.** True fruit is the fruit that is formed from the fertilized ovary of the flower and ovules get transformed into seeds

**S15. Ans.(b)**

**Sol.** Guttation is the process of secreting water droplets from the pores of some vascular plants like grass. Guttation is often confused with dew droplets that condense from the atmosphere on to the plants surface.

**S16. Ans.(b)**

**Sol.** Xylem is water conducting tissue in plants. If the Xylem of the plants is removed, upward movement of the water and transportation of solutes will stop leading to wilting of leaves and ultimately cause the death of plants.

**S17. Ans.(b)**

**Sol.** Fungi play an important role in energy cycling within, and between, ecosystems. Fungi are found in terrestrial, marine and freshwater environments, and are part of a diverse community of "decomposers" that break down dead plants and animals.

**S18. Ans.(d)**

**Sol.** The visible spectrum is the portion of the electromagnetic spectrum that is visible to the human eye. Electromagnetic radiation in this range of wavelengths is called visible light or simply light. A typical human eye will respond to wavelengths from about 380 to 700 nanometers.

**S19. Ans.(b)**

**Sol.** Arunachal Pradesh has the lowest record of population density having just 17 per square kilometre. Mizoram has 52, Sikkim has 86 and Himachal Pradesh has population density 123 per square kilometer.

**S20. Ans.(a)**

**Sol.** Growth of population from 1991-2001 is 11.7% in Tamil Nadu, 9.4% in Kerala, 15.2% in Goa and 14.6% in Andhra Pradesh where Growth of Population from 2001-2011 in Tamil Nadu is 15.6%, in Kerala is 4.9%, in Goa is 8.2% and in Andhra Pradesh is 11.1%. So Tamil Nadu is state where Population growth increase from 1991-2001 to 2001-2011.

**S21. Ans.(a)**

**Sol.** Corals need saltwater to survive and require a certain balance in the ratio of salt to water. This is why corals don't live in areas where rivers drain fresh water into the ocean. Corals also need sunlight to survive. Corals rarely develop in water deeper than 165 feet (50 meters). Corals generally live in water temperatures of 68–90° F or 20–32° C.

**S22. Ans.(c)**

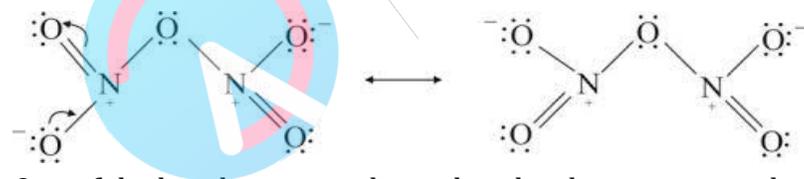
**Sol.** UP has the largest chunk of the total SC population, Punjab has the largest share of dalits in its population at 31.9%. Himachal Pradesh and West Bengal follow Punjab with 25.2% and 23.5%.

**S23. Ans.(d)**

**Sol.** Tamil Nadu has more than two major port that is Chennai Port, Tuticorin Port and Ennore Port. Where in Maharashtra has two major port that is JNPT and Mumbai Port. In West Bengal and Odisha both state has one major port.

**S24. Ans.(a)**

**Sol.** The molar mass of  $\text{Ba}(\text{OH})_2 = \text{Ba} + 2 \times (\text{O} + \text{H})$   
 $= 137.3 + 2 \times (16 + 1) = 171.3$   
 Equivalent weight of  $\text{Ba}(\text{OH})_2 = \frac{\text{molar mass}}{\text{mole factor}} = \frac{171.3}{2} = 85.7$

**S25. Ans.(d)****Sol.**

One of the bonds are coordinate bonds where nitrogen donates. Both its electrons to oxygen (otherwise, oxygen cannot have a single bond without a negative charge and no peroxy type linkage).

So, while determining oxidation state from the structure:

$$O.N = +2 + 2 + 1 = +5$$

**S26. Ans.(c)**

**Sol.** Diamond is a poor conductor of electricity, but is a good conductor of heat while Graphite is a good conductor of heat and electricity.

**S27. Ans.(a)**

**S28. Ans.(c)**

**Sol.** Let the distance between the object and its real image formed by a convex lens be  $d_1$ .

Let the distance of the object from the lens be  $x$ ,

So the image distance from the lens is  $(d - x)$ ,

$$\text{Then } x = \frac{d \pm \sqrt{d^2 - 4fd}}{2}$$

For real value of  $x$ ,

$$d^2 \geq 4fd$$

$$d \geq 4f$$

Therefore the minimum distance between the objects and its real image formed by convex lens is  $4f$ .

**S29. Ans.(c)**

**Sol.** Magnetic declination is the angle between magnetic north and true north.  $D$  is considered positive when the angle measured is east of true north and negative when west. Magnetic inclination is the angle between the horizontal plane and the total field vector, measured positive into Earth.

**S30. Ans.(c)**

**Sol.**  $I = 5A$

$P = 100 \text{ w}$

$V = 220 \text{ volt}$

Power = voltage  $\times$  current

$$P = V \times I$$

$$\Rightarrow 100 \times N = 220 \times 5$$

$$N = 11$$

So, 11 bulbs that can be safely connected in parallel in the circuit.



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