CBSE 2019 Sample Question Paper

SCIENCE

SOLUTION

Section A

1. Resultant Resistance will be less in parallel, than either of the individual resistances.

2. Pseudopodia.

3. A synapse is the gap between the two neurons. Here the axon terminal of one neuron is in close proximity to the dendrite of the second neuron. When a nerve impulse reaches the knob like nerve ending of an axon, a tiny amount of a chemical substance is released in the synapse. This chemical substance is called as the neurotransmitter. At synapse the electrical signals converted into chemicals, that can easily cross over the gap and pass on to the next neurons where it again converted into electrical signals.

4. To find the fuse rating total current must be calculated using the formula
$$P = V \times I$$
$$I = \frac{P}{V}$$
$$= \frac{2000}{220}$$
$$I = 9.09 \text{ A}$$
So the minimum fuse rating must be of 10 A that may be required for safe use.

5. $Zn + Liq\ X \longrightarrow A + Y\ (gas)$
Liq "X" must be Acids like HCl and Y must be H_2.

$Zn + 2\ HCl \longrightarrow ZnCl_2 + H_2$

(a) HCl
(b) H_2
(c)
    (i) It is colourless, odourless and tasteless gas
    (ii) It is lightest of all elements

6.
   (i) Movement of plant towards or away from the light. movement of plant parts towards the earth or away from it. movement of plant parts towards or away from any source of water.
   (ii) Both the brain and the spinal cord are protected by bone: the brain by the bones of the skull and the spinal cord is protected by a set of ring-shaped bones called vertebrae. They are both cushioned by layers of membranes called meninges as well as a special fluid called cerebrospinal fluid. This fluid helps to protect the nerve tissue to keep it healthy, and remove waste products.
   (iii) Pituitary gland present in the brain is known as the master gland.

7.
Object distance, $u = \infty$	(Infinity)
Image distance, $v = -80$ cm	(For point, in front of lens)

   And, Focal length, $f = ?$ (To be calculated)

   Putting these values in the lens formula :

   $$\frac{1}{v} - \frac{1}{u} = \frac{1}{f}$$

   we get $\quad \dfrac{1}{-80} - \dfrac{1}{\infty} = \dfrac{1}{f}$ $\qquad$ (Because $\dfrac{1}{\infty} = 0$)

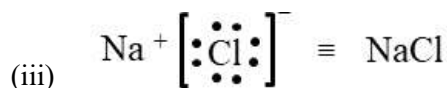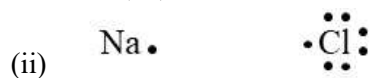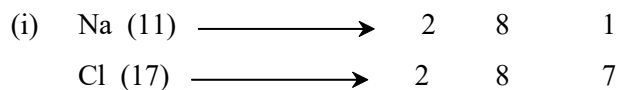   or $\quad -\dfrac{1}{80} = \dfrac{1}{f}$

   $f = -80$ cm

   Thus, the focal length of the required concave lens is 80 cm. We will now calculate its power.

   Please note that the focal length of, -80 cm is equal to $\dfrac{-80}{100}$ m or -0.8 m. Now,

   $$\text{Power, } P = \frac{1}{f(\text{in metres})}$$

   $$= \frac{1}{-0.8}$$

   $$= -\frac{10}{8}$$

   $$= -1.25 \text{ D}$$

   So, the power of concave lens required is, -1.25 dioptres.

8.
   (i) Na (11) $\longrightarrow$ 2 8 1
   Cl (17) $\longrightarrow$ 2 8 7

   (ii)

   (iii)

9. Warm-blooded animals have a relatively higher blood temperature and can maintain the constant internal body temperature through metabolic processes. Mammals and birds are warm-blooded animals.

   Cold-blooded animals like reptiles, amphibians and fish continuously change their body temperature with change in the temperature of the environment.

10.
   (a) pH = 7 (neutral)
   (b) pH = 12
   (c) pH = 5
   (d) pH = 2

11.
   (a) "A" is metal
   (b) "B" "C" & "D" are non-metals
   (c) A & B
   (d) B & D
   (e) B
   (f) C

12. Rancidity → The condition produced by aerial oxidation of fats and oils in foods marked by unpleasant smell and taste is called rancidity.

    Methods to Prevent the development of rancidity :
    (i)   Rancidity can be prevented by adding anti-oxidants of foods containing fats and oils.
    (ii) Rancidity can be retarded by keeping food in a refrigerator.
    Other damaging effect → Natural Hazard.

13. Geothermal energy is the heat energy form hot rocks present inside the earth. This heat can be used as a source of energy to produce electricity.

    A hole is drilled into the earth up to the hot rocks and a pipe is put into it. The steam present around the hot rocks comes up through the pipe at high pressure. This high pressure steam turns the turbine of a generator to produce electricity.

    Two advantages of geothermal energy are
    (i)   It is economical to use geothermal energy. This is because the cost of electricity produced by using geothermal energy is almost half of that produced from conventional energy sources.
    (ii) The use of geothermal energy does not cause any pollution. So, it is a clean and environment friendly source of energy.

14. An ammeter is an instrument which is used to measure the current in the circuit. The ammeter is always connected in series with the circuit in which the current is to be measured.
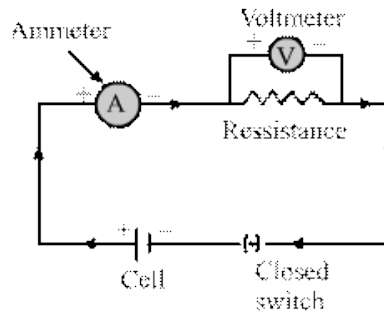
(i) Since the entire current passes through the ammeter, therefore, an ammeter should have very low resistance so that it may not change the value of the current flowing in the circuit.

(ii) A voltmeter has a high resistance so that it takes a negligible current from the circuit.

15. Let us assume that there exist a group of red beetles in some green bushes. Due to variation during sexual reproduction one green beetle evolved among them. This green beetle can pass the colour to its progeny which are green beetles.

Crows cannot see green beetles in green bushes and therefore, cannot eat them. The progeny of green beetles are not eaten while the progeny of red beetles continued to be eaten. As a result there are more and more green beetles in the beetle population. The progeny of green beetles increase due to natural selection which gives survival advantage.

16.
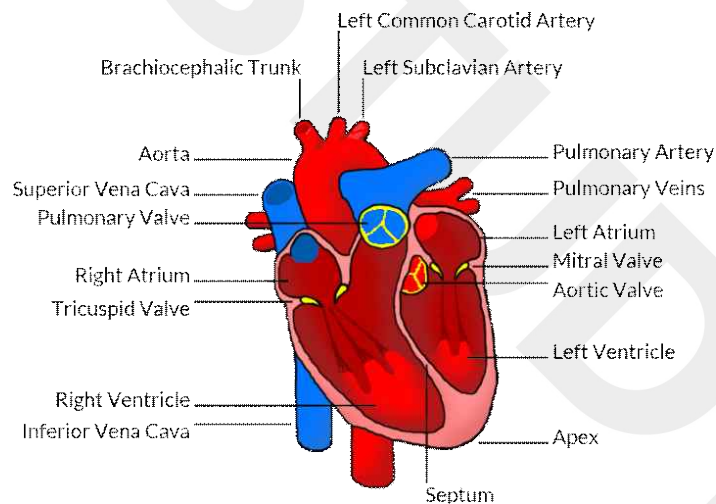
(a) For above diagram.
(i) Right atrium receives deoxygenated blood from vena cava.
(ii) Right ventricle pumps deoxygenated blood to lungs through pulmonary artery.
(iii) Left atrium receives oxygenated blood from lungs.
(iv) Left ventricle sends blood to all parts of body through aorta.

(b) Blood consists of plasma in which three types of blood cells WBC, RBC and platelets are found. Blood is a type of connective tissue.
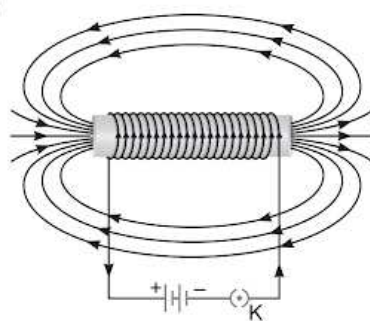
(c)
   (i) Transport of nutrients.
   (ii) Transport of hormones.
   (iii) Transport of excretory products (urea) to kidney for excretion.
   (iv) Transport of gases.

17.
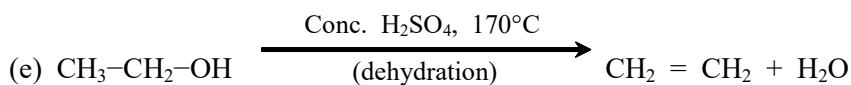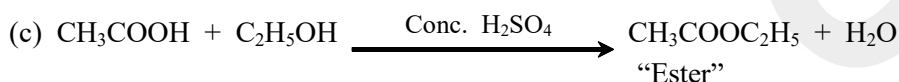   (i) The solenoid is a long coil containing a large number of close turns of insulated copper wire.

   (ii) The magnetic field lines inside the solenoid are in the form of parallel straight lines. This indicates that the strength of magnetic field is the same at all the points inside the solenoid.
   (iii) Soft Iron Core should be put inside a current carrying solenoid to make an electromagnet.

18.
   (a) Aldehyde   →   − CHO
       Carboxylic acid →   − COOH
   (b) We can distinguish between on alcohol and a Carboxylic acid on the basis of their reaction with Carbonates and Hydrogen Carbonates. Acids reacts with Carbonates and Hydrogen Carbonates to evolve Co_2 gas that turns line water milky. Alcohols, on the other hand, do not react with Carbonates and Hydrogen Carbonates.

   (c) $CH_3COOH + C_2H_5OH \xrightarrow{\text{Conc. } H_2SO_4} CH_3COOC_2H_5 + H_2O$
                                                        "Ester"

   (d) $2C_2H_5OH \longrightarrow 2C_2H_5O^- \ Na^+ + H_2$

   (e) $CH_3{-}CH_2{-}OH \xrightarrow[\text{(dehydration)}]{\text{Conc. } H_2SO_4, \ 170°C} CH_2 = CH_2 + H_2O$

19.
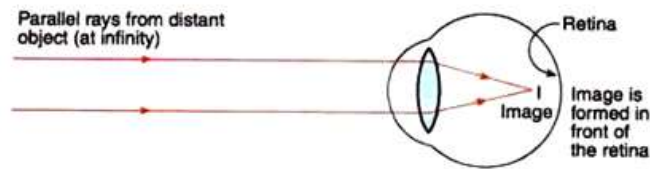   (a)
       (i) X – Monera, (ii) Y – Protista, (iii) Z – Plantae (Thallophyta)
   (b) Fungi are most advanced organisms as compared to Protista and Monera.
   (c) X — Bacteria
       Y — Amoeba
       Z —Spirogyra

20.
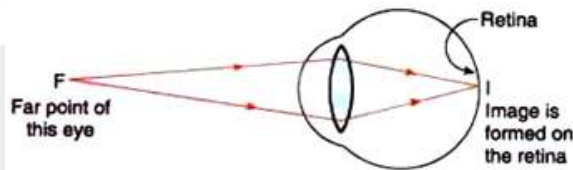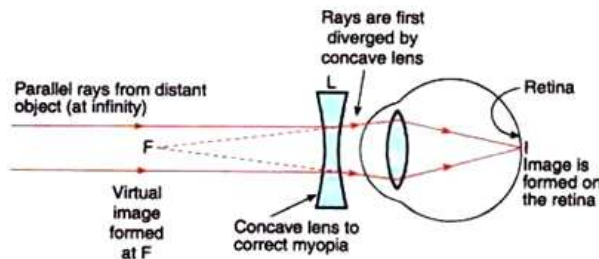
(i) Image formation of the blackboard writing by his eye-lens when he is seated at the last desk.

(ii) Image formation of the blackboard writing by his eye-lens when he is seated at the front desk.

Concave lens would help him to see clearly even when he is seated at the last desk.

21.

(a) Along the period valency first increase upto 4 then decrease.
(b) Along the period atomic radius decreases due to increase in effective nuclear charge.
(c) Metallic character decreases along the period and non-metallic increases.
(d) Electronegative character increases along the period.
(e) Metal oxides are basic and non-metal oxides are acidic. So along the period Acidic nature of the oxides increase.

22.
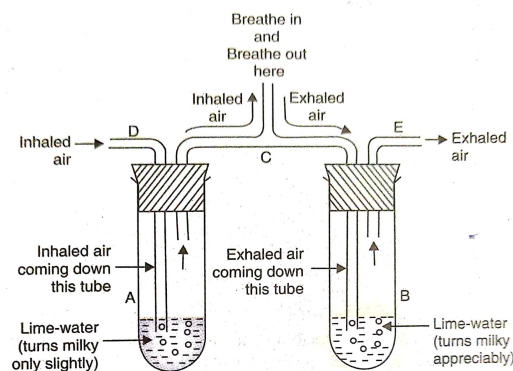
23. In the first graph, slope of V-I graph is resistance. Since, in series combination, resistance is more than the resistance in parallel combination, therefore slope of V-I graph for series combination is more than the slope of V-I graph for parallel combination. Hence, first graph is correctly labelled.

    In the second graph, slope of I-V graph is 1/resistance. hence, second graph is also correctly labelled.

24.
   (a) CO_2
   (b) $-COOH$
   (c) Formula $\rightarrow CH_3COOH$ (Acetic Acid)

25. First observation is incorrect because when the direction of flow of current is charged, the direction of the magnetic field and hence the direction of force on the compass needle also changes.

26.
   (a) Plaster of Paris $(CaSO4 . \frac{1}{2}H_2O)$ (Calcium Sulphate Hemihydrate)

   (b)
       (i)   Plaster of Paris is used in making toys, decorative materials etc
       (ii) It is used as a fire-Proofing material.

27.
   (a) Endocrine gland which secrete thyroxine is Thyroid gland.
   (b) It is present low on the front of neck i.e. present below adam's apple, along the front of the wind pipe.