

FIITJEE

MOCK TEST

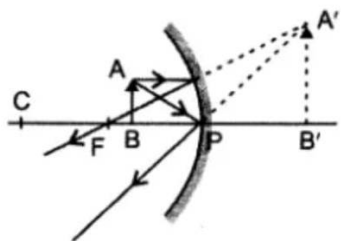
for Class Xth

Set - I

SCIENCE (CBSE) SOLUTIONS

SECTION - A

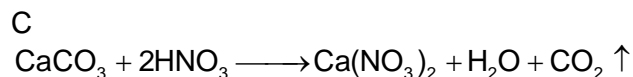
1. 22 pairs
2. Y chromosomes
3. Father
4. Female
5. C
Tendency to lose the electrons increases down the group.
6. Range of the object distance is 0 to 20 cm from the pole.
7. Image will be bigger than the object.
8. $R = 2f \Rightarrow 2 \times 20 \Rightarrow 40$ cm
- 9.



10. CH_3COCH_3 and $\text{CH}_3\text{COCH}_2\text{CH}_3$
11. (a) Bromine water test (unsaturated hydrocarbon (cooking oil) decolourises bromine water)
(b) Litmus test, NaHCO_3 test

12. B
Upon dilution with water the number of H^+ ions per unit volume decreases and thus pH increases

OR



13. B
14. C
15. B
16. C
17. A
18. C
The gas evolved is CO_2 which does not support combustion.
19. B
 $Zn(s) + \underset{\text{Blue}}{CuSO_4(aq)} \longrightarrow \underset{\text{Colourless}}{ZnSO_4(aq)} + Cu(s)$

20. A

SECTION – B

21. (a) An instrument which measures electric current in a circuit is called ammeter. It is always connected in series in a circuit through which the current is to be measured.
(b) Characteristics:
(i) Virtual image
(ii) Same size as the object
(iii) Laterally inverted
(iv) Same distance as the object
22. (a) If gypsum is heated above $100^\circ C$, then all its water of crystallization is eliminated and anhydrous $CaSO_4$ called dead burnt plaster is formed, which does not set like Plaster of Paris on adding water.
(b) $Na_2CO_3 \cdot 10H_2O \xrightarrow{\Delta} Na_2CO_3 + 10H_2O$
(Washing soda)
 $2NaHCO_3 \xrightarrow{\Delta} Na_2CO_3 + H_2O + CO_2 \uparrow$
(Baking soda)
 CO_2 gas is evolved upon heating baking soda which turns lime water milky.
No CO_2 gas is evolved upon heating washing soda.
23. Material transported by:
(i) Xylem – Water and minerals.
(ii) Phloem – Organic molecules like sucrose

- (iii) Pulmonary vein – Oxygenated blood from lungs to heart.
- (iv) Venacava – Deoxygenated blood from heart to lungs.
- (v) Pulmonary artery – Deoxygenated blood from heart to body parts
- (vi) Aorta – Oxygenated blood from heart to body parts.

24. DNA is Deoxyribo Nucleic Acid. It is generally located within the nucleus. It is the basic structure that makes up the chromosomes. It carries complete information for that organism. DNA is capable of replicating, thus making its own copies. For reproduction, it is mandatory that the cell must pass on the information to the next generation. Since DNA is capable of dividing, so it plays most important role in reproduction.

25. (i) $2Al + 3CuCl_2 \longrightarrow 2AlCl_3 + 3Cu$ (Displacement reaction)
 (ii) $Ca(OH)_2 + H_2SO_4 \longrightarrow CaSO_4 + 2H_2O$ (Neutralization reaction)
 (iii) $2Pb(NO_3)_2 \xrightarrow{\text{Heat}} 2PbO + 4NO_2 + O_2$ (Decomposition reaction)

26. (i) (a) She is suffering from myopia or near sightedness,
 (b) Focal length of corrective lens $(f) = \frac{100}{p}$ cm

$$= \frac{-100}{4.5} = -22.22 \text{ cm}$$

 (c) The corrective lens is concave lens.

OR

- (ii) (a) Total power = 100 + 60 = 160 W
 Electrical energy = pt = 160 × 5 × 60 = 48000 J
 (b) (i) Calorific value of bio-gas is much higher than that of animal dung cakes.
 (ii) Bio-gas is a smokeless fuel and leaves no residue on burning, on other hand animal dung cakes produces lot of smoke and leaves residue on burning.

27. (a) X is sulphur (S)
 Electronic configuration: K L M
 2 8 6
 (b) $2FeSO_4 \xrightarrow{\text{Heat}} Fe_2O_3(s) + SO_2(g) + SO_3(g)$
Ferrous sulphate Ferric oxide Sulphur dioxide Sulphur trioxide
 (c) Acidic (Non metal oxides are acidic in nature)

OR

- (a) Elements B and C
- (b) Elements A and C
- (c) $C < B < A$

On moving from left to right within a period the effective nuclear charge acting on valence electron increases, electrons are pulled more closer to the nucleus and tendency of the atom to lose the electrons decreases. Thus metallic character decreases.

28. Colour change needs not always give survival advantage. Example: If there is a population of red and blue beetles in an area, an elephant, who happens to pass by may stamp on this population. By chance the few beetles that have survived are mostly blue. This survival is only by chance and gave no survival advantage to a species.

29. (i) Magnetic field lines are closed continuous curves, which moves from north pole to south pole outside the magnet and from south pole to north pole inside the magnet.
(ii) Magnetic field lines are crowded near the pole where magnetic field is strong and far apart near the middle of magnet where magnetic field is weak.
(iii) The magnetic field lines never intersect each other and tangent at any point on field lines gives the direction of magnetic field at that point.
30. Feedback mechanism is a regulatory mechanism in which presence of certain level of hormone promotes or inhibits its further formation. Example: if the sugar level in blood rise, they are detected by the cells of the pancreas which respond by producing more insulin. As, the blood sugar level falls, insulin secretion is reduced.

SECTION – C

31. The rate of doing work is called power.

$$P = \frac{\text{Work}}{\text{Time}}; \text{ S.I. unit of power is J/s or watt.}$$

When an electric current flows through a resistance, then it becomes hot, it shows that electricity is a form of energy. Electrical heating has various applications in daily life : electric bulb, electric press, heater etc.

Let us consider a resistance wire with its end connected to the terminals of a battery. Suppose a current of I ampere flows in the wire for t second. Then, the charge carried from one end of the wire to the other is

$$Q = I \times t \text{ coulomb}$$

The work done or electric energy supplied, by the battery in forcing the charge from one end of the wire to the other is

$$W = V \times Q \text{ joule}$$

Where V is the p.d. in volt between the two ends of the wire.

Putting $Q = I \times t$, we have

$$W = V \cdot I \cdot t \text{ joule} \quad \dots(i)$$

If R be the resistance of the wire then, $V = I R$

$$\text{and} \quad W = I^2 R t \text{ joule} \quad \dots(ii)$$

$$\text{or} \quad W = \frac{V^2}{R} t \text{ joule} \quad \dots(iii)$$

Equations (i), (ii) and (iii) give the energy transferred from the battery into the resistance wire in t second. This energy is dissipated as heat in the wire.

If the energy dissipation of W joule produces H calorie of heat, then

$$H = W / J$$

Where J is the mechanical equivalent of heat ($J = 4.18 \text{ joule / calorie}$). Then from equations (i), (ii) and (iii), we have

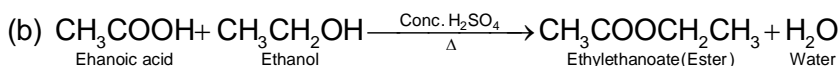
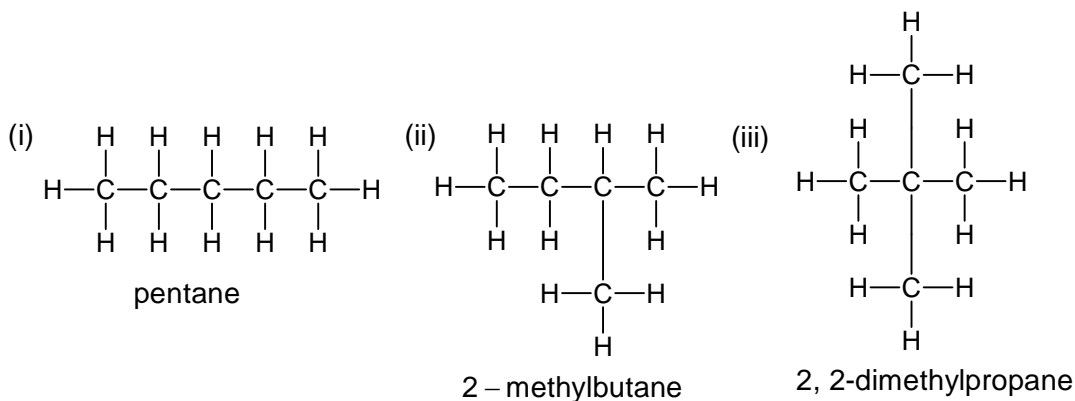
$$H = \frac{V I t}{J} = \frac{I^2 R t}{J} = \frac{V^2 t}{RJ} \text{ calorie.}$$

These relations are called Joule's law.

32. (a) When blood sugar level rises in blood, a hormone named 'insulin' is produced by β -cells of islet of Langerhans in the organ Pancreas. Pancreas also produces pancreatic juice which contains pancreatic enzymes such as trypsin, pancreatic amylase and pancreatic lipase.
(b) Positive geotropism is defined as movement towards the force of gravity.

For example – Roots grow downwards.
 Negative geotropism is defined as movement away from the force of gravity.
 For example – Shoots grow away from gravity.

33. (a)



Esterification reaction

H₂SO₄ acts as a dehydrating agent.

34. (a) (i) In yeast, pyruvate is converted into ethanol and carbon dioxide in the absence of oxygen. A small amount of energy is also released.
 (ii) In our skeletal muscles pyruvate is converted into lactic acid and energy where there is deficiency of oxygen. Accumulation of lactic acid results in muscular cramps.
 (iii) Aerobic oxidation of pyruvate occurs in the mitochondria where pyruvate molecule gives rise to molecules of CO₂, water and energy is released.
- (b) (i) The walls of ventricles are thick and muscular as compared to the walls of atria as they are required to pump blood to various organs. Right ventricle sends deoxygenated blood to lungs through pulmonary artery whereas left ventricle sends oxygenated blood to all parts of the body through aorta.
 (ii) Since the blood emerges from the heart under high pressure, the arteries have thick, elastic walls.

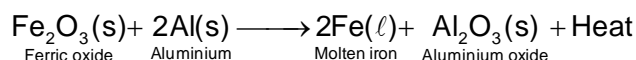
OR

- (a) (i) Even after cutting tail of a mouse its progeny continues to have tail. This is because it is acquired trait. The mouse continues to have information for presence of tail in its DNA and hence the progeny with tail.
 (ii) Archaeopteryx has reptilian features as presence of tail, vertebra, teeth etc.
- (b) In snail and garden lizard, sex is determined by outside temperature.
 (c) Phytoplanktons.
 (d) Amrita Devi Bishnoi National Award for wildlife conservation.
35. (a) Aluminium metal forms a thin layer of aluminium oxide (Al₂O₃) all over its surface under the action of moist air. This hard protective layer prevents the metal underneath from further corrosion. Further aluminium metal is cheap, easily available, malleable and ductile. Thus it is used to make cooking utensils.

Ionic Compounds		Covalent Compounds	
(1)	Are usually crystalline solids.	(1)	Are usually liquids or gases. Only some of them are solid.
(2)	Have high melting points and boiling points	(2)	Have usually low melting point and boiling point
(3)	Conduct electricity when dissolved in water or melted.	(3)	Do not conduct electricity
(4)	Usually soluble in water but insoluble in organic solvents.	(4)	Usually insoluble in water but soluble in organic solvents.

(c) X is ferric oxide or iron(III) oxide (Fe_2O_3)

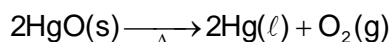
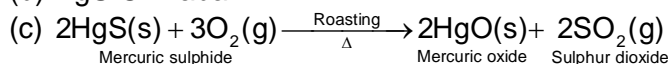
Thermite reaction



OR

(a) Mercury (Hg)

(b) HgS Cinnabar



(d) Thermometer

(e) No. Because it is less reactive than copper.

OR

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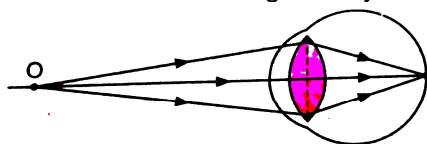
(d) Amrita Devi Bishnoi National Award for wildlife conservation.

36. (i) Myopia or Short-sightedness: A short-sighted person can see near objects clearly, but distant objects appear blurred.

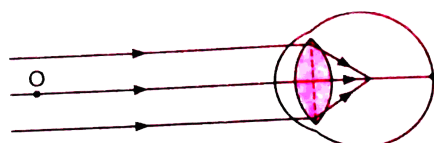
There may be two reasons for this defects:

(a) The eyeball is long, so that the retina is at an abnormally large distance from the cornea,

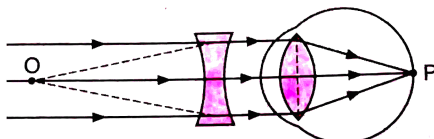
(b) Decrease in focal length of eye-lens that is, it is too convex or powerful.



(a) Far point of a myopic eye



(b) Myopic eye

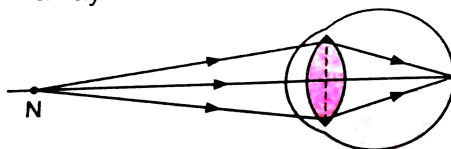


(c) Correction for myopia

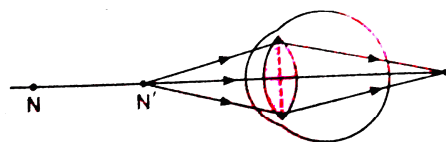
In either case, the light from a distant object arriving at the eye-lens may get converged at a point in front of the retina. This type of defect is called near-sightedness or myopia. This means that the eye is producing too much convergence in the incident beam. To compensate this, we interpose a concave lens between the eye and the object, with the diverging effect the image is focused on the retina as in figure (c). Parallel rays from a distant object are focused at a point P.

Thus, to correct a myopic eye, a person has to wear spectacles with a concave lens of suitable power.

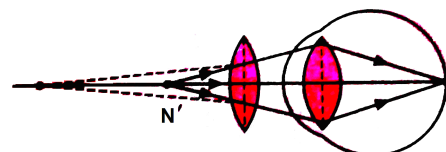
- (ii) **Hypermetropia or Long-sightedness:** A long-sighted person can see distant objects clearly, but objects closer to the eye appear blurred. His near-point is more than 25 cm away.



(a) Near point of a hypermetropic eye



(b) Hypermetropic eye



(c) Correction for hypermetropic eye

There may be two reasons for this defects:

- The eyeball is short, so that the retina is at an abnormally short distance from the cornea,
- The eye-lens is not sufficiently converging that is, increase in focal length of eye-lens.

In either case, the eye-lens focuses the incoming light at a point behind the retina, a convergent lens (convex lens) is needed to compensate for the defect in vision as in figure (c).

Thus to correct hypermetropia eye, a person has to wear spectacles with a convex lens of suitable power.

OR

- (i) The solar energy is used for cooking food using solar cookers and to produce electricity using solar cells.
- (ii) The plants absorb solar energy which convert it into chemical energy and is the source of bio-mass energy.
- (iii) Water cycle in nature shows that it is the solar energy which appears in the form of water flowing in rivers. It is this energy which is converted into Hydro-electric energy.
- (iv) Solar energy is stored in the oceans as ocean thermal energy (OTE).
- (v) Solar energy is the main factor responsible for blowing of the wind and hence for the wind energy. Thus, we see that solar energy is the ultimate or primary source of energy.