

MARKING SCHEME**COMMON PRE-BOARD EXAMINATION 2017-2018****SCIENCE - CLASS X***General Instructions:*

- The marking scheme provides guidelines to reduce subjectivity and maintain uniformity. The answer given in the marking scheme is best suggested answers.
- Marking be done as per the instructions provided in the marking scheme. (It should not be done according to one's own interpretation or any other consideration.)
- Alternative methods be accepted. Proportional marks be awarded.
- If a question attempted twice and the candidate has not crossed any answer, only first attempt be evaluated and 'EXTRA' be return with the second attempt.
- In case where no answers are given or answers are found wrong in this marking scheme, correct answers may be found and used for evaluation purpose.

1. C_4H_{10} ; C_6H_{14}

(½ + ½)

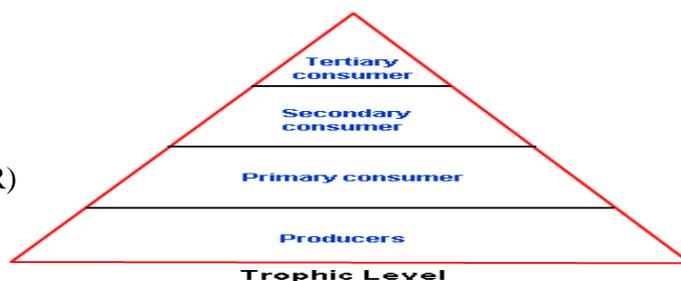
2. Producers

Primary carnivores

Secondary carnivores

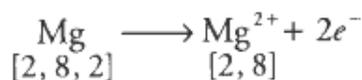
Tertiary carnivores

(OR)

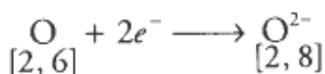


(1)

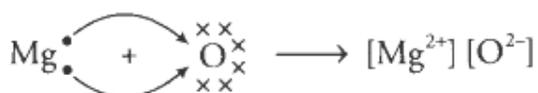
3.



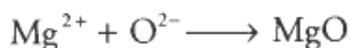
(½)



(½)



(1)



4. The ratio of sin of angle of incidence to the sin of angle of refraction is a constant.

$$\frac{\sin i}{\sin r} = n \quad (1)$$

Speed of light in vacuum $c = 3 \times 10^8 \text{ m/s}$

$$V = ?$$

$$n = 1.5$$

$$n = \frac{c}{v} \Rightarrow v = \frac{c}{n} = \frac{3 \times 10^8}{1.5} = 2 \times 10^8 \text{ m/s} \quad (1)$$

5. a) Oxidation reaction ($\frac{1}{2}$ x 4 = 2)
b) Double displacement and Precipitation reaction
c) Combination reaction
d) Displacement reaction

6. (a) Refer NCERT Book pg 97 (Figure : 6.3) (2)

(b) Desert plants open up their stomata during night and take in CO_2 . Stomata remain close during the day time to prevent the loss of water by transpiration. They store the CO_2 in their cells until the sun comes out and they can carry on with photosynthesis during the day time. (1)

7. Sunlight reaches the Earth's atmosphere and is scattered in all directions by the gases and the particles in the air. Blue light is scattered more than the other colours because it has the shorter wavelength. This is why the sky appears blue to an observer from the surface of the earth. (2)

For an astronaut staying in the international space station orbiting the Earth, the colour of the sky will be black because the light reaching it does not scatter. (1)

8. (a) A - Receptor ($\frac{1}{2}$)
B - Sensory neuron ($\frac{1}{2}$)
C - Motor neuron ($\frac{1}{2}$)
D - Effector ($\frac{1}{2}$)

(b) B - Carries impulse from receptor to spinal cord (1)
D - Responds to stimulus (1)

9. a) The locals benefitted from forest products. (1 x 3 = 3)
b) The wild life and nature were conserved.
c) The quality of air and soil was preserved.

10. Calcium sulphate hemihydrates (½)

It is prepared by heating gypsum at 373 K. (½)



Uses : 1. Used to prepare black board chalks. (½ x 2 = 1)

2. Used by doctors for plastering fractured bones.

OR

a) H^+ / H_3O^+ and OH^- respectively. (1/2+1/2)

b) Hydrochloric acid will be a stronger acid, because it produces more H^+ ions. (1/2 + 1/2)

c) Concentration of H^+ decreases with increase in dilution. (1)

11. (i) $I = \frac{V}{R} = \frac{220}{22} = 10\text{A}$ (1)

(ii) $R = R_1 + R_2 + R_3$

$$I = \frac{220}{11} = 20\text{A} \quad (1)$$

(iii) $\frac{1}{R} = \frac{1}{R_1} + \frac{1}{R_2} = \frac{1}{22} + \frac{1}{22} = \frac{2}{22}$

$$R = 11\Omega$$

$$I = \frac{220}{11} = 20\text{A} \quad (1)$$

12. (i) Cow dung cakes

(ii) Biogas

Biogas is better than cow dung cakes because it has high heating capacity and non-polluting as it burns without smoke and leaves no residues like ash. Slurry left in the biogas plant is a good manure for fields. (3)

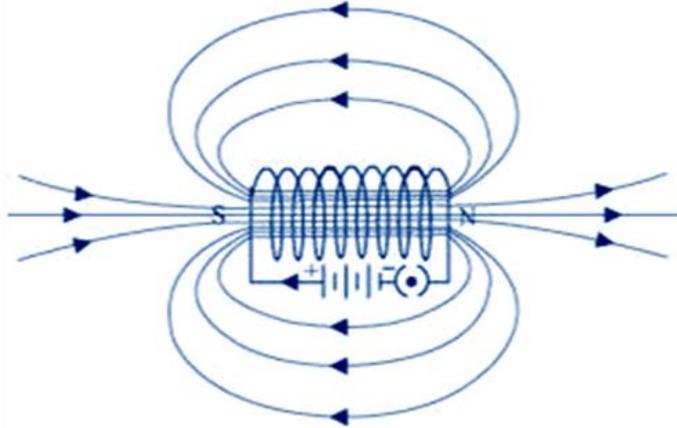
13. a) Valence electrons in D (2,8,5) = 5 (1 x 3 = 3)

$$\text{Valency of D} = 8 - 5 = 3$$

b) 'A' will have the largest atomic radii, atomic radius decreases from left to right along a period as the nuclear charge increases.

c) 'A' will form the most basic oxide as it is most metallic.

14. A solenoid is a long coil of circular loops of insulated copper wire. (1)



(2)

OR

i) As the magnet is moved closer to coil AB, the flux linked with the coil changes. This set up induced current in the coil as shown by deflection in the galvanometer (1)

ii) a) The direction of induced current in the coil AB is reversed and the galvanometer shows a deflection to the left. (2)

b) The galvanometer will show deflection to the right side and the left side continuously showing the current is induced continuously but changes its direction.

15. Fossils are dead remains of animals and plants from remote past. Fossils are formed when dead organisms are not completely decomposed. The organisms may get trapped in resins of tree, lava of volcanoes or hot mud, which when hardens retain the animal parts thus forming fossils. (2)

(a) Relative method: By estimating the age of the layer of earth's crust where the fossil is found. Fossils near the surface are recent and those in the deeper layers are more ancient. (1/2)

(b) Radio - carbon dating method: By detecting the ratios of different isotopes of carbon in the fossils. (1/2)

OR

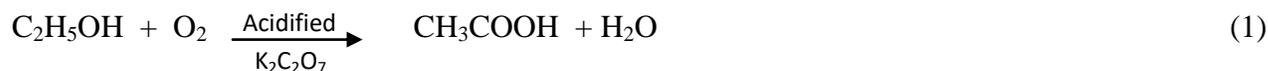
Structures which have a common basic structure but perform different functions are called homologous structures. e.g... fore limbs of reptiles, amphibians and mammals. (3)
For example: the forelimbs of frog and dog are homologous structure, as they are comprised of similar bones which are humerus, radio-ulna, carpal and metacarpals. The forelimbs of frog are adapted for jumping movement, while the forelimbs of dog are adapted for walking and running.

Yes, they have common ancestor but variously modified to carry out different activities. It is necessary that homologous structures always have a common ancestor.

16. a) P – Ethanol (C_2H_5OH)

Q – Ethanoic acid (CH_3COOH)

R – Sodium ethanoate (CH_3COONa) (2)



b) 1. It is used as a solvent. (1)

2. It is used in tonics and cough syrups.

3. It is used in wine, beer and whisky. (any two)

OR

a) Ethanol, Functional group- Alcohol (-OH) (2)

b) The product formed is a sweet smelling ester. This type of reaction is called esterification reaction. (1)



c) Ethanoic acid reacts with sodium bi-carbonate to produce CO_2 gas with rapid effervescence while ethanol shows no reaction. (1/2 + 1/2)

17. a) Sodium (1 x 5=5)

b) Lead

c) Copper

d) Carbon, Aluminium, Magnesium, Calcium (any one)

e) Hydrogen, hydrogen gas burns with a pop sound when a lighted splint is shown above the mouth of the test tube.

18. .(a) Refer NCERT Book pg 104 (Figure : 6.9) (1)

(i) Nasal passage. (1/2 x 4= 2)

(ii) Bronchioles

(iii) Alveoli.

(iv) Diaphragm

(b) Write any two

(2)

Aerobic respiration.	Anaerobic respiration.
1. Aerobic respiration takes place in the presence of oxygen	Anaerobic respiration takes place in the absence of oxygen
2. Complete breakdown of food occurs in the process	Incomplete breakdown of food occurs in the process
3. The end products are CO_2 and water	The end products may be ethyl alcohol, CO_2 or lactic acid
4. It produces a considerable amount of energy due to complete oxidation of food.	Less energy is produced due to incomplete oxidation of food

OR

(a). Two advantages:

Helps in absorption and upward movement of water and minerals from roots to the leaves (1)

Temperature regulation. (1)

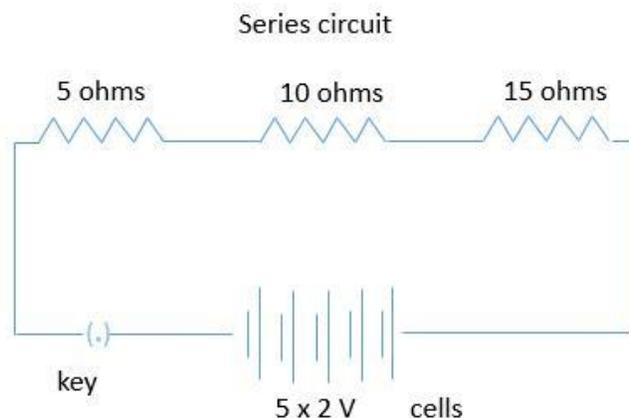
(b). (i) (2)

S.No	Transpiration	Translocation
1	Plays role in transport of water and minerals.	It is a transport of soluble products of photosynthesis.
2	Occurs through xylem by simple physical forces	Occurs through phloem in the form of sucrose by utilizing energy.

(ii) Because plants have a large proportion of dead cells in many tissues, they have low energy needs. So they use a slow transport system. (1)

19. a)

(2)



Applied potential difference

$$V = 5 \times 2 = 10V$$

Total resistance

$$R = 5 + 10 + 15 = 30 \text{ Ohm} \quad (1)$$

$$\text{Current, } I = \frac{V}{R} = \frac{10}{30} = 0.33A \quad (1)$$

$$b) \quad R = \frac{V}{I} = \frac{2}{0.1} = 20 \text{ Ohm} \quad (1)$$

20. (a) Absolutely not. (3)

i) Hint: Human approach/behaviour. (explanatory)

ii) One should be aware about the mode of transmission of disease, danger of sharing needles etc.

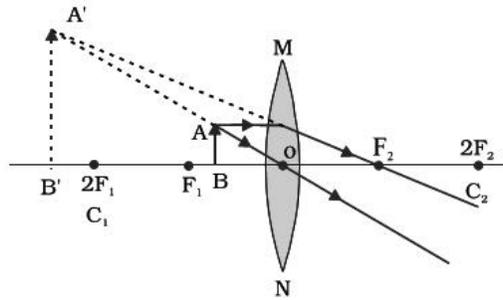
Associated Value : The learners will understand that only a generous and improved mindset of society can help the people to fight HIV/AIDS related problems.

(b) Gonorrhoea, Herpes, AIDS (any two) (1)

Ways to prevents STDs: (any two) (1)

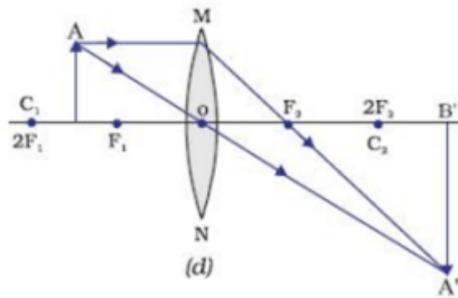
1. Use of condoms or other physical barriers.
2. Avoiding sexual contacts with unknown partners.
3. Avoid sharing towels or underclothing.
4. Get a vaccination for hepatitis B. This is a series of three shots.

21.



Convex lens form magnified erect image when object is placed between F_1 and optical centre O . Image formed is virtual, erect and enlarged and on the same side of the lens as the object.

(3)



Convex lens form magnified inverted image when object is placed between F_1 and $2F_1$. Image formed is real inverted and enlarged at infinity.

b) $f = +10\text{cm}$

$u = -20\text{cm}$

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

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

$\Rightarrow v = -6.67\text{cm}$

$$m = \frac{h'}{h} = \frac{v}{u}$$

$h = 4\text{cm}$

$\Rightarrow h' = \frac{-6.67}{-20} \times 4 = 1.33\text{cm}$

Image is diminished

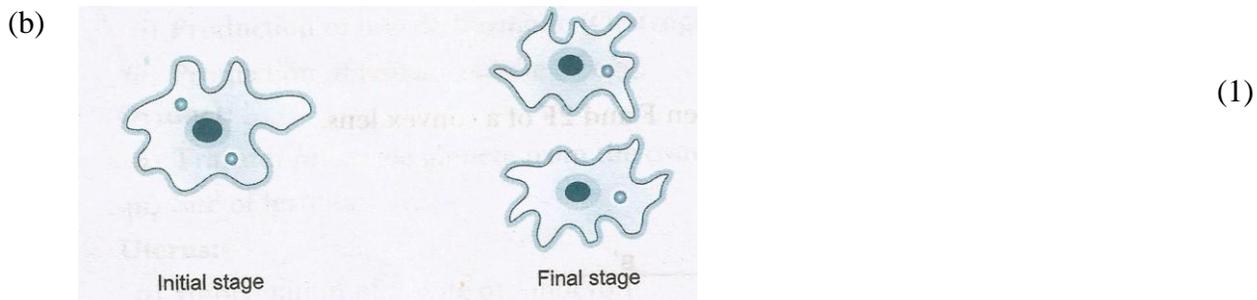
(2)

SECTION – B

22. HCl gas does not contain any ions. (1)

The blue colour of litmus paper changes to red. (1)

23. (a) Asexual reproduction - Binary fission (1)



24. (a) In the experimental set-up shown in the figure, water is found to rise in the delivery tube because potassium hydroxide kept in the small test-tube absorbs CO₂. (1)

(b) KOH solution kept in the test tube inside the air tight conical flask absorbs the evolved carbon dioxide released by germinating seeds there by creating a partial vacuum in the conical flask. So an equal volume of water rises up in the tube. (1)

25. Equivalent resistance in series $(R_S) = R + R = 2R$

Equivalent resistance in parallel $(\frac{1}{R_P}) = \frac{1}{R} + \frac{1}{R} = \frac{2}{R}$ (1)

$$R_P = \frac{R}{2}$$

$$\text{So, } R_S - R_P = 2R - \frac{R}{2}$$

$$= \frac{3R}{2} \quad (1)$$

26. a) Beyond $2F_1$ (1)

b) Greater (1)

OR

Screen is moved slightly away from the lens

Given: Height of the object (h_1) = 4cm

Object distance (u) = -12cm

Image distance (v) = 24cm

Height of the Image (h_2) = ?

$$\text{Magnification } m = \frac{h_2}{h_1} = \frac{v}{u}$$

$$\frac{h_2}{4} = \frac{24}{-12}$$

$$h_2 = -8\text{cm} \quad (1)$$

Image will be 2 times magnified. The negative sign shows the image is inverted. (1)

27. The role of common salt is to favour the precipitation of soap. (1)

Glycerol is the by-product of saponification. (1)