



# COMMON PRE-BOARD EXAMINATION :2022-23

## Class-X Subject: SCIENCE - 086

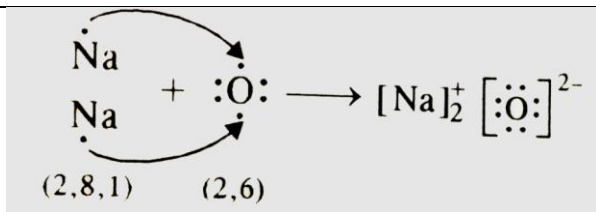


Date: 19/01/2023

Marking Scheme

MM : 80

Q no.	Value points	Marks
SECTION – A		
1.	(d) III and IV	1
2.	(b) pH=8.6	1
3.	(b) II and III	1
4.	(a) The litmus paper used is dry	1
5.	(b) (ii) and (iii)	1
6.	(c) A—(iii), B—(iv), C—(i), D—(ii)	1
7.	(b) I and III	1
8.	(c) water in guard cells	1
9.	(b) Big size and complex body designs.	1
10.	(a) 50%	1
11.	(b) It is secreted by stimulated cells and reaches all cells of the body.	1
12.	(a) gametes, zygote, embryo, seedling	1
13.	(c) 2A	1
14.	(a) perpendicular to plane of paper upward	1
15.	(b) be doubled	1
16.	(c) Straight lines parallel to each other	1
17.	(c) Assertion is true and Reason is false	1
18.	(b) Both A and R are true but R is not the correct explanation of A.	1
19.	(b) Both A and R are true but R is not the correct explanation of A.	1
20.	(d) A is False but R is true	1
SECTION – B		
21.	(a) $2\text{ZnS}(\text{s}) + 3\text{O}_2(\text{g}) \xrightarrow{\text{Heat}} 2\text{ZnO}(\text{s}) + 2\text{SO}_2(\text{g})$	1
	(b) $\text{ZnCO}_3(\text{s}) \xrightarrow{\text{Heat}} \text{ZnO}(\text{s}) + \text{CO}_2(\text{g})$	1
	OR	
	(a) Formation of sodium oxide by electron transfer	1



(b)  $\text{HNO}_3$  being a strong oxidising agent oxidises the  $\text{H}_2$  formed to water. 1

22. Auxin is plant hormone which is synthesized at the tip of the shoot. It helps the cell grow longer. When a tendril comes in contact with a support, auxin stimulates faster growth of the cells on the opposite side that's why the tendril forms a coil around the support. 2

23. (i)The process of digestion gets completed in the small intestine by intestinal juice.  
(ii)Finger-like projections called villi provide larger surface area for absorption.  
(iii)The villi are richly supplied with blood vessels to enable easy absorption into the bloodstream. (1+1=2m) 2

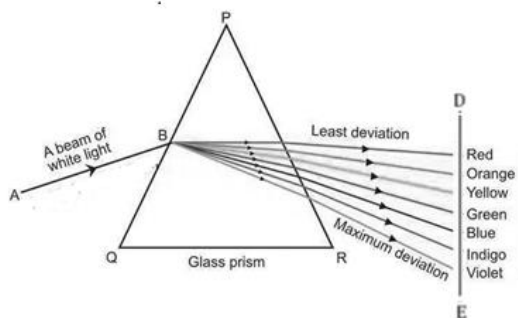
24. (i)Storage in cellular vacuoles  
(ii)Storage in leaves that fall off  
(iii)Storing as resins and gums in old xylem  
(iv)By excreting into the soil around them. (1/2\*4=2m) 2

25 The phenomenon of change in the direction of propagation of light caused by the large number of molecules, such as smoke, tiny water droplets, suspended particles of dust and molecules of air present in the Earth's atmosphere, is called scattering of light. 1

- The colour of the scattered light perceived by us depends on the size of the scattering particles. 1/2
- The sky appear dark instead of blue to an astronaut as no particles are present in space for scattering of light 1/2

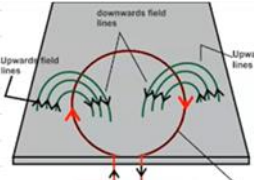
OR

The angle between the direction of incident ray and the emergent ray, is called the angle of deviation. 1



1

26.	According to the 10% law of energy transfer between the different trophic levels, Energy available to snakes from rats $10/100 \times 500 = 50 \text{ J}$ Energy available to hawks $10/100 \times 50 = 5 \text{ J.}$	(1+1=2m)	2
<b>SECTION - C</b>			
27.	(a) The reaction is a thermal decomposition reaction. Gas evolved is $\text{NO}_2$	$\frac{1}{2} + \frac{1}{2}$	3
	(b) $2\text{Cu}(\text{NO}_3)_2 \rightarrow 2\text{CuO} + 4\text{NO}_2 + \text{O}_2$	1	
	(c) Aqueous solution of gas has pH less than 7. (Since X is non-metallic oxide so it is acidic in nature)	1	
28.	Y- $\text{Cl}_2$ Z- $\text{CaOCl}_2$ $2\text{NaCl}(\text{aq}) + 2\text{H}_2\text{O}(\text{l}) \rightarrow 2\text{NaOH}(\text{aq}) + \text{Cl}_2(\text{g}) + \text{H}_2(\text{g})$ $\text{Ca}(\text{OH})_2 + \text{Cl}_2 \rightarrow \text{CaOCl}_2 + \text{H}_2\text{O}$	$\frac{1}{2}$ $\frac{1}{2}$ 1 1	3
29.	(a) The exchange of gases can take place on the surface which is provided by the alveoli. The walls of the alveoli are supplied with an extensive network of blood vessels. Thus, lungs maximize the area for a gaseous exchange through the presence of large numbers of alveoli which are richly supplied with blood. <b>2m</b> (b) The rate of breathing in aquatic organisms is much faster than that in terrestrial organisms because the amount of dissolved oxygen in water is fairly low, compared to the amount of oxygen in the air. <b>1m</b> <b>OR</b> Translocation is the movement of materials from leaves to other tissues throughout the plant by the phloem. During translocation, sucrose is transferred into sieve tubes of phloem via the companion cells using energy from ATP. This increases the osmotic pressure inside the sieve tubes which causes movement of water into the sieve tubes from the adjacent xylem. This pressure helps in translocation of material in the phloem to tissues which have less pressure.		3
<b>SECTION - D</b>			
30	(a) $f = R/2 = 20/2 = 10\text{cm}$ (b) Mirror 1 – Concave mirror used as dentist's mirror/shaving mirror/in solar furnace	$\frac{1}{2} + \frac{1}{2}$ $\frac{1}{2} + \frac{1}{2}$	3

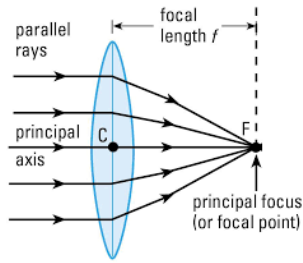
	Mirror 2 – Convex mirror used as rare view mirror	$\frac{1}{2} + \frac{1}{2}$	
31	(a) $n_m = \frac{\text{speed of light in air}}{\text{speed of light in medium}} = \frac{c}{v}$ or $n_m \propto \frac{1}{v}$  (b) (i) excessive curvature of the eye lens (ii) elongation of the eyeball.  $F = 1/P = -1/4 = -0.25\text{m}$	1  $\frac{1}{2} + \frac{1}{2}$ $\frac{1}{2} + \frac{1}{2}$	3
32	Figure B represents the correct pattern of field lines. In figure A, field lines cross each other which is not possible because if they cross each other, at the point of intersection, there would be two directions of field lines. poles of magnet facing each other are north poles (b) A compass needle is itself a tiny pivoted magnet and experiences a force exerted by a magnetic field set up due to a bar magnet. Due to this magnetic force, needle gets deflected when brought near a bar magnet.  OR the direction of magnetic field lines inside the loop are going into the table while outside the loop they are coming out of the table.	$\frac{1}{2}$ 1 $\frac{1}{2}$  1  1	3
			
	Relative closeness of field lines indicates the strength of magnetic field. Since field lines are crowded around the ends of the solenoid, hence these are the regions of strongest magnetism. b. The direction of the magnetic field will also be reversed when the direction of current changes .	1 1	
33.	(a) Energy trapped by the autotrophs has to be converted from one form to another, to be absorbed by the herbivores. The solar energy captured cannot be reverted back to the sun. (b) It shields the surface of the earth and protects all living organisms from the harmful effects of the UV light from the sun. (c) They decompose dead remains of plants and animals and their wastes organic products into simple inorganic substances which are released into the atmosphere for reuse by the plants. Thus, they help in recycling of materials. <b>(1*3=3m)</b>		3
<b>SECTION D</b>			
34.	(a) (i) Ethanoic Acid/ Acetic acid - $\text{CH}_3\text{COOH}$ (ii) Ethanol - $\text{C}_2\text{H}_5\text{OH}$ (iii) X -Ester/ Ethyl ethanoate - $\text{CH}_3\text{COOC}_2\text{H}_5$	$\frac{1}{2} + \frac{1}{2}$ (name & formula) $\frac{1}{2} + \frac{1}{2}$ $\frac{1}{2} + \frac{1}{2}$	5

	<p>(b) (i) Acetylene has <u>high carbon content</u>, therefore, <u>incomplete combustion</u> causes it to burn with sooty flame. 1</p> <p>(ii) It is because carbon can neither lose four electrons nor gain four electrons. It can share four electrons to form covalent bonds. 1</p> <p style="text-align: center;">OR</p> <p>(a) An atom or a group of atoms replacing the hydrogen atom/s in a carbon chain and confer specific properties to the compound. 1</p> <p>(i) -CHO (ii) -CO- <math>\frac{1}{2} + \frac{1}{2}</math></p> <p>(b) <math display="block">\text{C}_2\text{H}_5\text{OH} \xrightarrow{\text{conc. H}_2\text{SO}_4} \text{C}_2\text{H}_4 + \text{H}_2\text{O}</math> 1</p> <p>(conc. <math>\text{H}_2\text{SO}_4</math> should be mentioned or <math>\frac{1}{2}</math> marks to be deducted.</p> <p>(c) Detergents are better cleaning agents as <u>they do not form precipitate with calcium and magnesium ions present in hard water</u>. 1</p> <p>Demerit- They are non-biodegradable 1</p>	
35.	<p>(a) Diagram- <b>1m</b> Labellings- (i) vas deferens (ii) seminal vesicle (iii) prostate gland (iv) testis. <b>(<math>\frac{1}{2} \times 4 = 2\text{m}</math>)</b></p> <p>(b) The testes are placed outside the body because, they require a lower temperature for sperm production. Testes which is located outside the body provides a temperature 2-3C less than the body temperature. <b>1m</b></p> <p>(c) Syphilis and Gonorrhoea <b>(<math>\frac{1}{2} \times 2 = 1\text{m}</math>)</b> OR</p> <p>(a) Yes, through cross pollination. <b>1m</b></p> <p>(b) (i) Vegetative propagation is used to grow plants in which seeds are not formed or very few seeds are formed. Examples: banana, pineapple, orange. (ii) It helps to grow plants in conditions where seed germination fails due to change in environment. (iii) It is a faster, easier and cheaper process. (iv) The plants produced are genetically similar and good quality or variety can be preserved easily. (any 2) <b>(<math>1 \times 2 = 2\text{m}</math>)</b></p> <p>(c) In Leishmania, binary fission occurs in a definite orientation due to the presence of flagellum at the end of the cell. Hence, there is a specific plane in which the fission occurs, while Amoeba can undergo binary fission in any plane. <b>1m</b></p> <p>(d) The zygote will have 16 chromosomes. <b>1m</b></p>	5
36	<p>(a) (i) The lamps are in parallel. <math>\frac{1}{2}</math></p> <p>(ii) all the bulbs have the same voltage = 60V. But lamp C has the highest current ( lowest resistance )</p>	5

	<p><math>P=VI</math> or <math>P = V^2/R</math></p> <p>The lamp C with the highest power will glow the brightest. <span style="float: right;">1½</span></p> <p>(iii) For Domestic circuits parallel arrangement is always used because:          In parallel circuits, if one electrical appliance stop working due to some effect then all other appliances keep working normally.          In parallel circuit, each electrical appliance has own switch due to which it can be turn off or on independently, without effecting other appliances.          In parallel circuits, each electrical appliance gets same voltage as that of the power supply line.          In the parallel connection of electrical appliances, the overall resistance of the house hold circuit is reduced due to which the current from the power supply is high. <span style="float: right;">{any two} 2</span></p> <p>(b) The earth wire, provides a low-resistance conducting path for the current and ensures that any leakage of current to the metallic body of the appliance keeps its potential to that of the earth, and the user may not get a severe electric shock. <span style="float: right;">1</span></p>	
	<b>SECTION – E</b>	
37.	<p>(a) Aluminium reacts with atmospheric oxygen to form a thin oxide layer which protects the metal from further corrosion. <span style="float: right;">1</span></p> <p>(b) <math>Z &lt; Y &lt; X</math> <span style="float: right;">1</span></p> <p>(c) Only Al can displace hydrogen from HCl <span style="float: right;">1</span>  <math>2Al + 6HCl \rightarrow 2AlCl_3 + 3H_2</math> <span style="float: right;">1</span></p> <p style="text-align: center;">OR</p> <p>(c) Copper metal is less reactive than Zinc and hence cannot displace Zn from <math>ZnSO_4</math> <span style="float: right;">½</span>          but Zn being more reactive displaces the Cu from its solution to form <math>ZnSO_4</math> so blue colour of <math>CuSO_4</math> fades away. <span style="float: right;">½</span>  <math>Zn + CuSO_4 \rightarrow ZnSO_4 + Cu</math> <span style="float: right;">1</span></p>	4
38.	<p>(a) YYRR and rryy <span style="float: right;">(1/2*2=1m)</span></p> <p>(b) 9:3:3:1 ; dihybrid cross <span style="float: right;">(1/2*2=1m)</span></p> <p>(c) 9- yellow, round          3- green, round          3- yellow, wrinkled          1- green, wrinkled <span style="float: right;">(1/2*4=2m)</span></p> <p style="text-align: center;">OR</p> <p>(c) (i) Traits are inherited, but the recessive traits are not expressed in the presence of the dominant traits.          (ii) Characters are independently inherited and new combination of characters are expressed in the <math>F_2</math> generation. <span style="float: right;">(1*2=2m)</span></p>	4

39.

(a)



1

4

(b) Optic centre

1

(c) Given :  $v = +20 \text{ cm}$  ,  $f = +15 \text{ cm}$  ,  $u = ?$ 

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

$$\frac{1}{15} = \frac{1}{20} - \frac{1}{u}$$

$$\frac{1}{u} = \frac{1}{20} - \frac{1}{15} = \frac{-5}{300}$$

$$u = \frac{300}{-5} = -60 \text{ cm}$$

object should be placed at 60cm in front of the lens

OR

(c)  $m = -1$  image is real, inverted and of the same size.

It is convex lens.

 $m = -1$ ., the object is at  $2F$  and the image is also at  $2F$ .Therefore, distance between  $u$  &  $v = 4f = 60 \text{ cm}$ .

$$\therefore f = 60/4 = 15 \text{ cm.}$$

2