

A.P. SET CODE
A

MT - W

2017 __ __ 1100 - MT - W - SCIENCE & TECHNOLOGY (72) - I - SET - A (E)

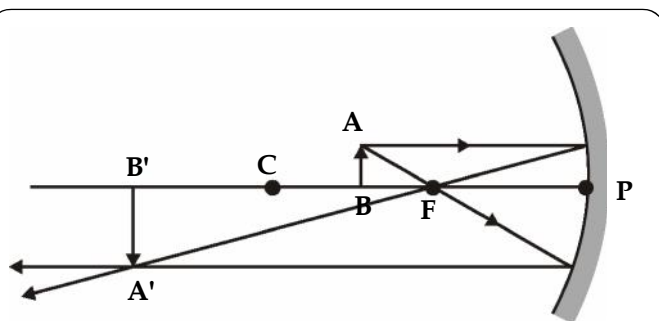
Time : 2 Hours Preliminary Model Answer Paper Max. Marks : 40

A.1.	(A) Answer the following sub-questions :		
	(1) Fill in the blanks and rewrite the complete statements :		
	(i) Silicon and antimony are metalloids .	1	
	(ii) The focal length of a convex lens is positive.	1	
	(2) Match the following :		
	Column 'A'	Column 'B'	
	(i) Sulphur	- (b) Non-metal	1
	(ii) Manganese	- (c) Transition metal	1
	(iii) Cerium	- (a) Lanthanide	1
A.1.	(B) Rewrite the following statements by selecting the correct options :		
	(1) In series combination current remains constant.	1	
	(2) The litmus paper or the litmus solution is obtained from Lichen plants.	1	
	(3) The ray of light gets deviated when it passes from one medium to another medium because the velocity of light changes .	1	
	(4) The chemical reaction in which H ₂ is lost is known as an oxidation reaction .	1	
	(5) A straight line plot is obtained when current is plotted against potential difference. Which of the following law is verified - Ohm's law .	1	

A.2. Answer the following subquestions : (any five)

- (1) A ray diagram for object between F and C for a concave mirror.

2

**Image position :** Beyond centre of curvature.**Nature :** Real, inverted and magnified.

- (2) (i) In the visible range of light, maximum scattering of blue light and the least scattering of red light takes place.
 (ii) As red light is scattered the least by atmosphere, it can travel larger distance.
 Hence, danger signals are red coloured.

2

- (3) (a) **Optical centre of a lens :**
 The central point of lens on the principal axis is its optical centre. When a ray of light passes through the optical centre of a lens, it passes without undergoing any deviation.
 (b) **Focal length of a lens :**
 The distance of principal focus and optical centre of a lens is its focal length.

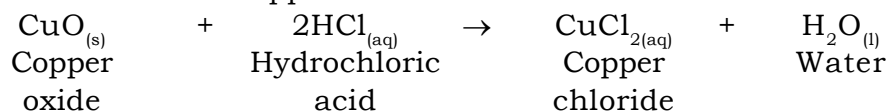
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- (4) (i) Potassium ferrocyanide, is a yellow coloured compound.
 (ii) If this compound gets exposed to sunlight, then it will undergo oxidation reaction.
 (iii) In this reaction potassium ferrocyanide gets converted into potassium ferricyanide.
 (iv) So to prevent this oxidation reaction, potassium ferrocyanide is stored in dark coloured bottles and kept away from sunlight.

2

- (5) When copper oxide reacts with dilute hydrochloric acid, it gives a blue solution of copper chloride.

2



(6)	<p>Air pollution can affect the health of human beings in many ways with both short term and long term effects:</p> <p>Short term effects include:</p> <p>(i) Irritation of eyes, nose, mouth and throat. (ii) Respiratory infections such as bronchitis, pneumonia. (iii) Headaches, nausea and allergy. (iv) Asthma attacks. (v) Reduced lung functioning.</p> <p>Long term effects include:</p> <p>(i) Chronic pulmonary disease. (ii) Cardio vascular disease. (iii) Lung cancer. (iv) Premature death.</p>	2
A.3. Answer the following subquestions : (any five)		
(1)	<p>(a) The electric current (I) flowing in a metallic conductor is directly proportional to the potential difference (V) across its terminals, provided physical conditions of the conductor such as length, area of cross section, temperature and material remain constant. $V \propto I$ or $R = \frac{V}{I}$</p> <p>(b) Given : Current(I) = 0.24 A P.D.(V) = 24 V To find : Resistance(R) = ? Formula : $V = IR$ Solution : $V = IR$</p> $R = \frac{V}{I}$ $R = \frac{24}{0.24}$ $R = 100 \Omega$ <p>The resistance of the conductor is 100 Ω.</p>	3
(2)	<p>(a) Silver Chloride (b) Double displacement reaction</p> <p>(c) $\begin{array}{ccccccc} \text{NaCl} & + & \text{AgNO}_3 & \rightarrow & \text{AgCl} \downarrow & + & \text{NaNO}_3 \\ \text{Sodium} & & \text{Silver} & & \text{Silver} & & \text{Sodium} \\ \text{Chloride} & & \text{Nitrate} & & \text{Chloride} & & \text{Nitrate} \\ & & & & \text{(white)} & & \end{array}$</p>	3

(3)	<p>(i) Concave lenses are used in his spectacles.</p> <p>(ii) Aniket is suffering from myopia(near-sightedness).</p> <p>(iii) $P = \frac{1}{f} \quad \therefore f = \frac{1}{P}$</p> $= \frac{1}{-0.5D} = -2 \text{ meters.}$ <p>This is the focal length of the lenses used in his spectacles.</p>	3
(4)	<p>The rules are as follows :</p> <p>(i) If the incident ray is parallel to the principal axis, then the reflected ray passes through focus.</p> <p>(ii) If the incident ray is passing through the focus, then the reflected ray is parallel to the principal axis.</p> <p>(iii) If the incident ray passes through the centre of curvature, the reflected ray traces the same path.</p>	3
(5)	<p>(i) It is used in washing clothes as a cleansing agent.</p> <p>(ii) It is used for softening of hard water to soft water.</p> <p>(iii) It is used in refining of petroleum.</p> <p>(iv) It is used in manufacturing detergent powder, paper and glass.</p>	3
(6)	<p>(a) To avoid noise pollution in classroom :</p> <p>(i) When teacher is not present in the classroom, all the students should observe silence and not shout loudly.</p> <p>(ii) Monitors in the class should control the classroom.</p> <p>(iii) During free periods, the teacher should involve the class in activities like drawing, story-telling, book reading etc. so that the students maintain silence.</p>	1
	<p>(b) To minimize electricity consumption at home :</p> <p>(i) Switch off the fans and lights whenever not in use.</p> <p>(ii) Use of electronic appliances should be minimal.</p> <p>(iii) Use of CFL lamps.</p> <p>(iv) All family members should watch TV in one room rather than having different TV sets in different rooms.</p> <p>(v) Avoid unnecessary use of air conditioners.</p>	1
	<p>(c) Busing fire crackers in festivals and processions :</p> <p>(i) People should be motivated not to burst fire crackers as they produce noise and air pollution.</p> <p>(ii) If necessary noiseless crackers and crackers which cause minimal pollution should be used.</p>	1

- (iii) Fire crackers should not be burst near hospitals and other silence zones. A ban should be imposed on bursting of crackers after 10pm.

A.4. Answer the following subquestion : (any one)

- (1) (i) Let R_1 , R_2 and R_3 be the three resistances connected in parallel combination between points C and D and let R_p be their effective resistance.
- (ii) Let I_1 , I_2 and I_3 be the currents flowing through resistances R_1 , R_2 and R_3 respectively.
Let I be the current flowing through the circuit and V be the potential difference of the cell.
- (iii) For parallel combination of resistances,

$$I = I_1 + I_2 + I_3 \dots\dots (i)$$

According to Ohm's law,

$$I = \frac{V}{R_p}$$

Therefore,

$$I_1 = \frac{V}{R_1}, \quad I_2 = \frac{V}{R_2}, \quad I_3 = \frac{V}{R_3}.$$

- (iv) Substituting the values of I , I_1 , I_2 and I_3 in equation (i) we get

$$\frac{V}{R_p} = \frac{V}{R_1} + \frac{V}{R_2} + \frac{V}{R_3}$$

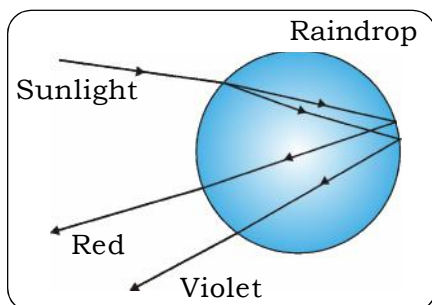
$$V \left(\frac{1}{R_p} \right) = V \left(\frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} \right)$$

$$\therefore \frac{1}{R_p} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}$$

For 'n' number of resistances

$$\frac{1}{R_p} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} + \dots + \frac{1}{R_n}$$

(2)



5

- (i) A rainbow appears in the sky during a rain shower.
- (ii) The water droplets act as small prisms. When sunlight enters the water droplets present in the atmosphere, they refract and disperse the incident sunlight.
- (iii) Then they reflect it internally inside the droplet and finally again refract it. As a collective effect of all these phenomenon, the seven coloured rainbow is observed.

