SET - D

A.P. SET CODE
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2017 ___ __ 1100 - MT - z - SCIENCE & TECHNOLOGY (72) - I - SET - D (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) Elements present in group 1 and 2 on the left side and 13 to 17 on the right side of the periodic table are called **normal elements**.	**1**
	(ii) When a light ray travels obliquely from air to water, it bends **towards** the normal at the point of incidence.	**1**
(2)	**State whether the following statements are true or false and if false, write the correct statement :**	
	(i) False - Resistivity of pure metals is less than of alloys.	**1**
	(ii) False - Magnetic lines of force never cross each other.	**1**
(3)	**Considering the relationship in the first pair, complete the second pair :**	
	$CuCl_2 + 2KI \rightarrow CuI_2 + 2KCl$: Double displacement : :	**1**
	$Zn + 2HCl \rightarrow ZnCl_2 + H_2$: Displacement reaction	
Q.1.	**(B) Rewrite the following statements by selecting the correct options :**	
(1)	Inside water, an air bubble behaves : **always like a concave lens**.	**1**
(2)	Concentration of **hydrogen** ions can be measured with the pH scale.	**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)	When the crystals of ferrous sulphate are strongly heated, the residue obtained is **red in colour**.	**1**
(5)	The mirror formula : $\frac{1}{v}+\frac{1}{u}=\frac{1}{f}$	**1**

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

(1) **2**

(i) Tendency to lose electrons is the characteristic of metals.

(i) Atomic radius decreases as we move from left to right in a period.

(iii) This is because the electrons are added to the same outermost shell because of which the electrons added experience greater pull from the nucleus.

(iv) Therefore, the electrons are not easily released. Thus, metallic character i.e. tendency to lose electrons decreases from left to right in a period.

(2) **2**

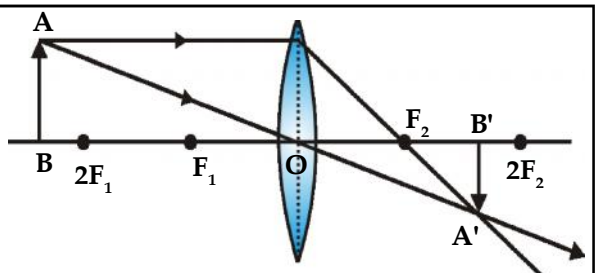


Image position : Between F_2 and $2F_2$.
Nature : Real, inverted and diminished.

(3) **2**

(i) If we touch the wire bare footed, a large current may pass through our body.

(ii) As a result, we may receive a severe shock. This shock may sometimes cause death.

(iii) Therefore, while working with electricity we must wear gloves made of insulated material and rubber soled shoes.

(iv) Hence wires carrying electricity should not be touched bare footed.

(4) **2**

Newlands' Law : When the elements are arranged in increasing order of their atomic masses, the properties of every eighth element are similar to that of the first.

Table 1.2

H	Li	Be	B	C	N	O
F	Na	Mg	Al	Si	P	S
Cl	K	Ca	Cr	Ti	Mn	Fe

Examples :

(i) The eighth element from lithium is sodium. Similarly, eighth element from sodium is potassium. Lithium, sodium, potassium have similar chemical properties.

(ii) The eighth element from fluorine is chlorine. Fluorine and chlorine have similar chemical properties.

(5) When sodium carbonate reacts with dilute hydrochloric acid, it gives sodium chloride, water and carbondioxide gas is liberated. **2**

$$\underset{\text{Sodium carbonate}}{Na_2CO_{3(s)}} + \underset{\text{Hydrochloric acid}}{2HCl_{(aq)}} \rightarrow \underset{\text{Sodium chloride}}{2NaCl_{(aq)}} + \underset{\text{Water}}{H_2O_{(l)}} + \underset{\text{Carbon dioxide}}{CO_{2(g)}}$$

(6) (i) Green house effect due to gases like CO_2, CH_4 etc. **2**
(ii) Excessive burning of fossil fuels along with deforestation and pollution.

A.3. Answer the following subquestions : (any five)

(1) Converging lens (convex lens), f = 10cm, u = -20cm v =? **3**

(i) $$\frac{1}{f} = \frac{1}{v} - \frac{1}{u}$$

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

$$= \frac{1}{10\,cm} + \frac{1}{-20\ cm}$$

$$= \frac{1}{10\,cm} - \frac{1}{20\ cm}$$

$$= \frac{2-1}{20\ cm}$$

$$= \frac{1}{20\ cm}$$

$$\therefore v = 20cm$$

The image distance is 20cm.

(2) When oxidation and reduction take place simultaneously in a given reaction, it is termed as redox reaction. During oxidation a reactant combines with oxygen or loses hydrogen and during reduction it gains hydrogen or loses oxygen. **3**

(i) In the given reaction

$CuO_{(s)} + H_{2(g)}$ ì $Cu_{(s)} + H_2O_{(l)}$

Copper oxide is reduced to copper and hydrogen is oxidised to water.

(ii) In the given reaction

$BaSO_4 + 4C$ ì $BaS + 4CO$

Barium sulphate is reduced to barium sulphide and carbon is oxidised to carbon monoxide.

(3) (i) After it has rained, many water droplets are present in the atmosphere. They act as small prisms. **3**
(ii) When sunlight in incident on a water droplet present in the atmosphere, there occurs refraction of the incident light. The refractive index of water is different for different colours. It is maximum for violet colour and minimum for red colour. This produces dispersion of light.
(iii) This is followed by internal reflection of light inside the droplet and subsequent refraction as it passes from water to air. The combined effect of all these phenomena is the formation of rainbow.

(4) **3**

Conductors	Insulators
(i) The substances which have very low electrical resistances are called conductors.	(i) Those substances which have infinitely high electrical resistances are called Insulators.
(ii) They contain a large number of free electrons.	(ii) They contain practically no free electrons.
(iii) Conductors are mostly metals.	(iii) Insulators are mostly non metals.

(5) (i) Acid reacts with base to form salt and water. **3**

$$\underset{\text{Acid}}{HA} + \underset{\text{Base}}{BOH} \rightarrow \underset{\text{Salt}}{BA} + \underset{\text{Water}}{H_2O}$$

(ii) It is known that, acid generates H^+ and base generates OH^- ions.
(iii) The H^+ ions of an acid and OH^- ions of a base react with each other to form unionized water.

$$H^+_{(aq)} + OH^-_{(aq)} \rightarrow H_2O(l)$$

(iv) The process is termed as neutralization.
(v) The product obtained out of this reaction is salt and water.

(6) Effects of noise pollution on human beings depend on noise intensity, frequency and exposure duration. There are three types of effects on human body: **3**
(i) Auditory effects : Auditory fatigue, deafness.
(ii) Non-auditory effects : Communication interference, sleep interference, concentration interference, ill-temper, annoyance, violent behaviour, mental disorientation, bickering and loss of working efficiency.
(iii) Physiological effects: Nausea, fatigue, anxiety, visual disturbances, insomnia, hypertension, cardio vascular disease.

A.4. **Answer the following subquestion : (any one)** **5**

(1) (a) (i) Iris in human eye controls and regulates the amount of light entering the eye by contracting and dialating the pupil.

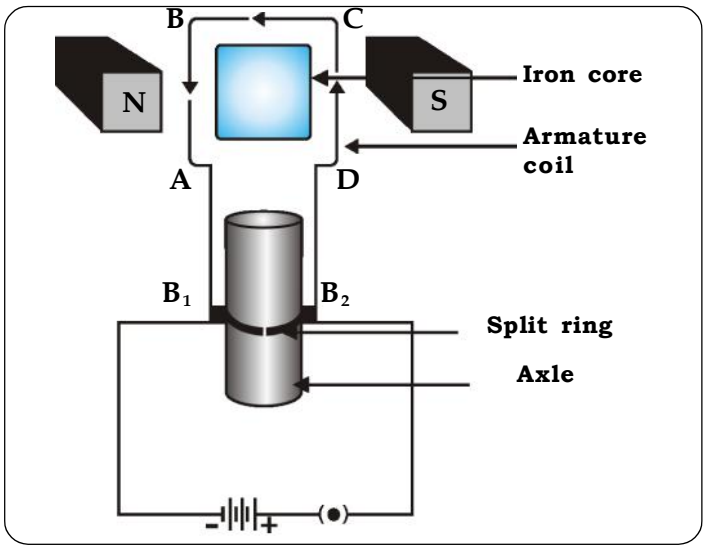
(ii) Ciliary muscles adjust the focal length of eye lens by contracting and relaxing.

(b) (i) Iris is similar to diaphragm

(ii) the pupil is similar to aperture

(c) Distance of distinct vision is 25cm for a normal eye.

(2) **5**



(i) A device which converts electrical energy into mechanical energy is called an electric motor.

(ii) Electric motor works on the principle that a current carrying conductor placed in a magnetic field experiences a force.

Working of the electric motor :

(a) When current is passed through the coil ABCD, arms AB and CD experience force.

(b) According to Fleming's left hand rule the force experienced by arm AB is in the upward direction and arm CD in the downward direction. Both these forces are equal and opposite.

(c) This force rotates the coil in clockwise direction until the coil is vertical. At this position, the contact between commutator and brushes break. So the supply to the coil is cut off. Thus no force acts on the coil.

(d) But the coil does not stop due to inertia. It goes on rotating until the commutator again comes in contact with the brushes B_1 and B_2. Again the current starts passing through the coil and the arm AB rotates through 90°, 180°, 270° and 360 degrees.

(e) Now the force acting on arm AB is upward and CD is downward. Again this force moves the coil in clockwise direction.

(f) Thus, the coil rotates with the help of electrical energy. The coil of DC motor continues to rotate in the same direction.

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