

# Model Question Paper

## Part - 1

Time: 2 Hours

Total Marks: 40

Q.1. (A) Choose the correct alternative.

[5]

- i. Person has a mass of 8.4 kg. Its weight on moon if the value of 'g' on earth is  $10 \text{ m/s}^2$ , will be  
(A) 14 N (B) 504 N (C) 25 N (D) 450 N
- ii. Main function of Indian Remote Sensing Satellite is,  
(A) to study the weather.  
(B) to fix location of any place on earth's surface.  
(C) to establish communication between two different places.  
(D) to observe and guide in case of natural calamities like flood and earthquake.
- iii. When aluminium metal reacts with dilute hydrochloric acid, \_\_\_\_\_ gas is liberated.  
(A) oxygen (B) hydrogen (C) chlorine (D) hydrogen peroxide
- iv. Heat is liberated when \_\_\_\_\_  
(A) water converts into vapour (B) ice melts.  
(C) water heats. (D) water vapour condenses.
- v. When rays of light are incident on a glass slab, then the incident ray and emergent ray are \_\_\_\_\_ to each other.  
(A) parallel (B) perpendicular (C) concurrent (D) opposite

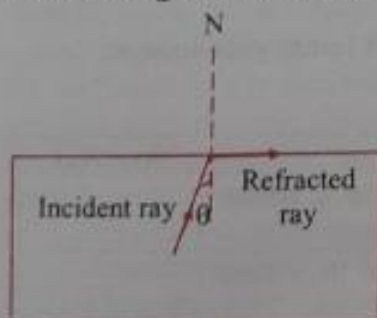
[5]

(B) Answer the following.

- i. State true or false. If false, write correct sentence.  
To convert SI unit of heat into its CGS unit, conversion factor used is 4.18.
- ii. Complete the given analogy.  
High earth orbits : 35780 km :: Low earth orbits: \_\_\_\_\_
- iii. Match the following:

	Column I		Column II
a.	Groups 1 and 2	1.	p-block
b.	Groups 3 to 12	2.	d-block
		3.	f-block
		4.	s-block

- iv. Name the angle  $\theta$  shown in the figure below.



- v. Find the odd one out and justify your answer.  
Focal length, radius of curvature, image distance, size of image.

[4]

Q.2. (A) Give scientific reasons. (Attempt any 2)

- i. Value of g is zero at the centre of the earth.
- ii. The portion of the pencil inside the water appears to be thicker and broken near the surface of water.
- iii. Carbon generally forms compounds by covalent bonds.

Q.2. (B) Answer the following. (Attempt any 3)

[6]

- i. Rohit was testing a convex lens of focal length 30 cm. He placed an object at various distances and noted the readings according to given observation table.

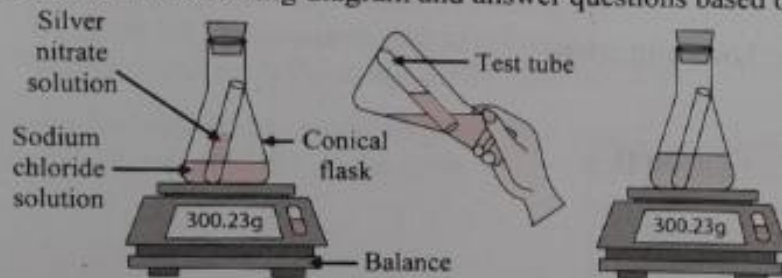
Complete the given table.

Object distance	Position of image	Size of image
60 cm	-----	Same size
53 cm	Beyond $2F_2$	-----
-----	At infinity	Highly magnified
24 cm	-----	Highly magnified

- Write short note on: Mendeleev's periodic law.
- An electric bulb is connected to 250 volts. If the current of 0.5 A passes through it, what is the power of the bulb?
- Give four examples of natural macromolecules
- Distinguish between: mass and weight of an object.

**Q.3. Answer the following. (Attempt any 5)**

- Select the appropriate options and complete the following paragraph.  
(cornea, faint, conical, rod, image, coloured, retina, colours, myopic, presbyopic, colour blind)  
The \_\_\_\_\_ in our eyes consists of many light sensitive cells. These cells are shaped like a rod and like a cone. The \_\_\_\_\_ shaped cells give information about the intensity of light to the brain. The \_\_\_\_\_ cells give information about the colour of the object to the brain. Brain processes all the information received and we see the actual image of the object. Rod shaped cells respond to \_\_\_\_\_ light also but conical cells do not. Thus we perceive \_\_\_\_\_ only in bright light. Some people cannot recognize few colours or cannot distinguish between different colours. These persons are said to be \_\_\_\_\_. Apart from not being able to distinguish between different colours, their eye sight is normal.
- Observe the following diagram and answer questions based on it.



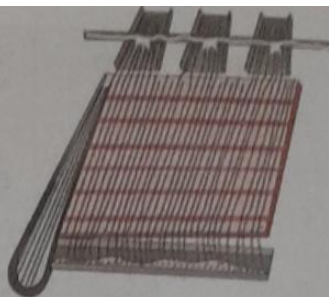
- Name the products of the reaction.
  - Write chemical equation involved.
  - Does the reaction follow law of conservation of mass? Justify your answer.
- Complete the following table.

	Condition	Its effect	Diagram
a.	When a light ray passes from a rarer medium to a denser medium	-----	-----
b.	When a light ray passes from a denser medium to a rarer medium	-----	-----
c.	When a light ray is incident normally at the boundary between two media i.e., $i = 0$	-----	-----

- The electronic configuration of metal 'A' is 2, 8, 1 and that of metal 'B' is 2, 8, 2. Which of the two metals is more reactive? Write their reactions with dilute hydrochloric acid.
- Suppose the orbit of a satellite is exactly 35780 km above the earth's surface. Determine the tangential velocity of the satellite.
- Liquid ammonia is used in ice factory for making ice from water. If water at  $20^\circ\text{C}$  is to be converted into 2 kg ice at  $0^\circ\text{C}$ , how many grams of ammonia are to be evaporated? (Given: Latent heat of vaporisation of ammonia = 341 cal/g).



vii. Label the diagram given below and explain it.

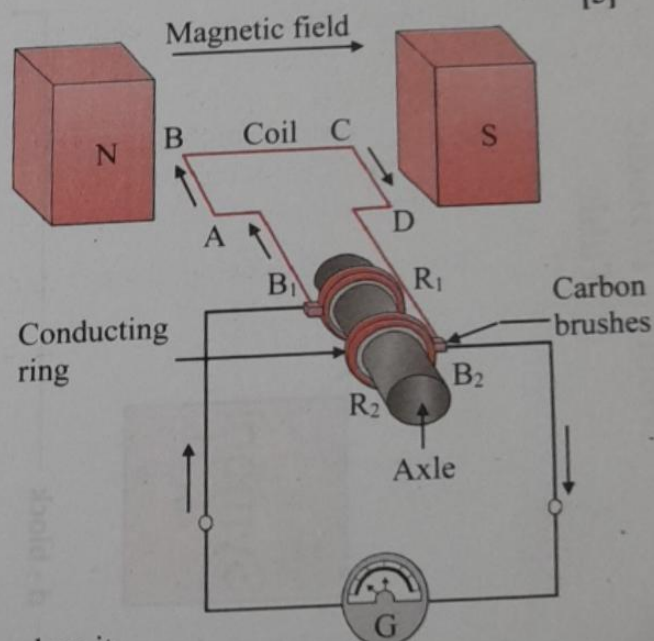


viii. Complete the following table.

Sr. No.	Common name	Structural formula	IUPAC Name
a.	Ethylene	$\text{CH}_2 = \text{CH}_2$	.....
b.	Acetic acid	$\text{CH}_3 - \text{COOH}$	.....
c.	Ethyl alcohol	$\text{CH}_3 - \text{CH}_2 - \text{OH}$	.....
d.	Acetone	$\text{CH}_3 - \text{CO} - \text{CH}_3$	.....
e.	Ethyl methyl ketone	$\text{CH}_3 - \text{CO} - \text{CH}_2 - \text{CH}_3$	.....
f.	n-Propyl chloride	$\text{CH}_3 - \text{CH}_2 - \text{CH}_2 - \text{Cl}$	.....

Q.4. Answer the following. (Attempt any 1)

- Observe the given diagram and answer the questions.
  - Construction of which equipment does the above diagram show?
  - On which principle does the above equipment work?
  - Explain the flow of current in external circuit, when current in the loop is in the direction  $\text{A} \rightarrow \text{B} \rightarrow \text{C} \rightarrow \text{D}$ .
  - Explain the flow of current in external circuit, when electric current in the loop is in the direction  $\text{D} \rightarrow \text{C} \rightarrow \text{B} \rightarrow \text{A}$ .
  - State the use of carbon brushes.



- Read the following paragraph and answer questions based on it.  
 Group 2 metals are also called alkaline earth metals. The general chemical equation for the reaction of group 2 metals with water is given as,  $\text{M} + 2\text{H}_2\text{O} \longrightarrow \text{M}(\text{OH})_2 + \text{H}_2$ , where, M is group 2 metals. Larger the electropositivity or electronegativity, higher is the reactivity. The chemical reactivity of group 2 metals increases when we move down in group as  $\text{Be} \rightarrow \text{Mg} \rightarrow \text{Ca} \rightarrow \text{Sr} \rightarrow \text{Ba}$ . The electropositivity of group 1 metals is higher than the corresponding group 2 metals. Hence, group 1 metals are more reactive than group 2 metals. Based on the above paragraph, answer the following questions:
  - Which metal is the most reactive in period 3?
  - Name the group 2 metal that does not react with water.
  - Name the group 2 metal that reacts with steam only.
  - Name the group 1 metal that is least reactive with water.
  - Out of calcium and potassium, which is more reactive?