

# MT

2018 \_\_\_\_ 1100

Seat No. 

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**MT - SCIENCE & TECHNOLOGY - I (72) - SEMI PRELIM - II : PAPER - 5**

**Time : 2 Hours**

**(Pages 4)**

**Max. Marks : 40**

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Note :

- (i) All questions are compulsory.
- (ii) Draw neat and labelled diagrams wherever necessary.

**Q.1. (A) Solve the following questions : [5]**

(1) **Fill in the blank :**

The splitting of sunlight into its component colours is called .....  
of light.

(2) **Name the following:**

A process in which some substances undergo bond breaking and are transformed into new substances by formation of new bonds.

(3) What is the value of 'g' at the centre of the Earth?

(4) **State whether the following statement is 'True' or 'False'. If false; write the correct statement for the same:**

As we move from left to right in a period in Modern Periodic table, atomic size of the elements gradually increases.

(5) **Complete the analogy:**

Concave lens : Negative focal length :: Diverging lens : .....

**Q.1. (B) Choose the correct alternative and rewrite the sentences : [5]**

(1) Which of the following is formed when Sodium hydroxide reacts with hydrochloric acid?

- (a) Calcium Chloride
- (b) Hydrogen Chloride
- (c) Sodium hydride
- (d) Sodium Chloride

- (2) Rakesh performs the experiments on tracing the path of a ray of light passing through a rectangular glass slab for different angles of incidence. He observes that in all cases
- $\angle i > \angle r$  but  $\angle i = \angle e$
  - $\angle i < \angle r$  but  $\angle i = \angle e$
  - $\angle i > \angle e$  but  $\angle i = \angle r$
  - $\angle i < \angle e$  but  $\angle i = \angle r$
- (3) The periodic time of a planet is 'T' and the mean distance of the planet from the Sun is 'r', then according to Kepler's third law .....
- $T^2 \propto r^3$
  - $T \propto r^3$
  - $T^2 \propto r$
  - $T^3 \propto r^2$
- (4) ..... resembles alkali metals as well as halogens.
- Lithium
  - Sodium
  - Hydrogen
  - Silicon
- (5) When an object is placed between  $F_1$  and  $2F_1$  in front of a concave lens, the image formed is .....
- enlarged and erect
  - diminished and erect
  - real and enlarged
  - diminished and inverted

**Q.2. Solve the following questions : (Any 5)**

**[10]**

- Explain what happens when following reaction takes place and give the balanced chemical equation :**  
Potassium chromate solution is added to solution of Barium sulphate.
- Let the period of revolution of a planet at a distance R from a star be T. Prove that if it was at a distance of 2R from the star, its period of revolution will be  $\sqrt{8}$  T.
- Distinguish between:**  
Mendeleev's periodic table and Modern Periodic table.
- Draw a ray diagram for object position at  $2F_1$  for a convex lens.
- Give scientific reason :**  
Respiration is considered to be an exothermic reaction.

- (6) Write down the electronic configuration of the following elements from the given atomic numbers. Answer the following question with explanation :

$_{11}\text{Na}$ ,  $_{15}\text{P}$ ,  $_{14}\text{Cl}$ ,  $_{14}\text{Si}$ ,  $_{12}\text{Mg}$

Which of these has largest atom?

- (7) Give reason stars twinkle at night.

**Q.3. Solve the following questions : (Any 5)**

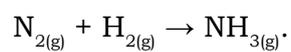
**[15]**

- (1) An iron ball of mass of 3 kg is released from height of 125 m and falls freely to the ground. Assuming that the value of  $g$  is  $10\text{m/s}^2$ , calculate
- time taken by the ball to reach the ground
  - velocity of the ball on reaching the ground
  - the height of the ball at half the time it takes to reach the ground.
- (2) Define :
- Centre of curvature of a lens
  - Principal axis of a lens
  - Optical centre of a lens
- (3) Answer the following questions based on the concept of total internal reflection :
- What is the angle of incidence called as when angle of refraction is  $90^\circ$ ?
  - State any one phenomena in nature which is based on total internal reflection.
  - State any one condition required for total internal reflection.
- (4) Give four uses of decomposition reaction.
- (5) Pritesh has spectacles. The power of the spectacles is  $-2.5\text{D}$ .
- Name the eye defect.
  - What is wrong with his eyeball?
  - Which spectacles will he use?
- (6) Write a note on Redox Reaction.
- (7) Merits of Modern Periodic table over Mendeleev's periodic table.

**Q.4. Solve the following questions : (Any 1)**

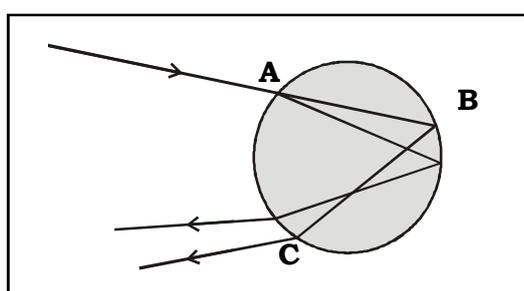
**[5]**

(1) (a) **Balance the following equation stepwise:**



(b) Give a comparative study of all the four-blocks of Modern Periodic table.

(2)



(a) Define dispersion of light.

(b) State the phenomena that occur at point A, B and C.

**Best Of Luck** 🍀