

MT

2018 ___ ___ 1100

Seat No.

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MT - SCIENCE & TECHNOLOGY - I (72) - SEMI PRELIM - II : PAPER - 3

Time : 2 Hours

(Pages 3)

Max. Marks : 40

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:**
When the angle of incidence is more than critical angle takes place.
- (2) **Name the following:**
The life on earth is protected from ultraviolet radiation of the sun.
- (3) **State whether the following statement is 'True' or 'False'. If false; write the correct statement for the same.**
The focal length of a convex lens is positive.
- (4) **State whether the following statement is 'True' or 'False'. If false; write the correct statement for the same.**
Metals are electronegative and non-metals are electropositive.
- (5) Complete the analogy :
 6×10^{24} kg : Mass of the Earth : : 6.4×10^6 m :

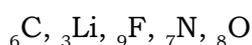
Q.1. (B) Choose the correct alternative and rewrite the sentences : [5]

- (1) Oily food kept out for few days gives a bad taste and a bad smell because of
 - (a) Corrosion
 - (b) Displacement
 - (c) Heating
 - (d) Rancidity

- (2) A ray of light strikes a glass slab at an angle of 50° with the normal to the surface of the slab. What is the angle of incidence?
(a) 50° (b) 25° (c) 40° (d) 100°
- (3) As the height of the object from the surface of the Earth increases, value of 'g' becomes
(a) more (b) less
(c) equal (d) can't say
- (4) triad does not follow Dobereiner's law of triad.
(a) Li, Na, K (b) Ca, Sr, Ba
(c) Mg, Ca, Sr (d) Cl, Br, I
- (5) Inside water, an air bubble behaves
(a) like a flat plate (b) like a concave lens
(c) like a convex lens (d) like a concave mirror

Q.2. Solve the following questions : (Any 5)**[10]**

- (1) **Explain what happens when following reaction takes place and give the balanced chemical equation:**
Sodium carbonate solution is added to calcium chloride solution.
- (2) An object kept 60 cm from a lens gives a virtual image 20 cm in front of the lens. What is the focal length of lens? Is it a converging lens or a diverging lens?
- (3) **Distinguish between:** Alkali metals and Alkaline earth metals
- (4) The absolute refractive index of water is 1.36. What is the velocity of light in water? (velocity of light in vacuum is 3×10^8 m/s)
- (5) **Give scientific reason :**
It is recommended to use air tight container for storing oil for long time.
- (6) **Write down the electronic configuration of the following elements from the given atomic numbers. Answer the following question with explanation:**



Which of the above elements has the highest non-metallic character?

- (7) The value of 'g' at the centre of the Earth is zero. Explain?

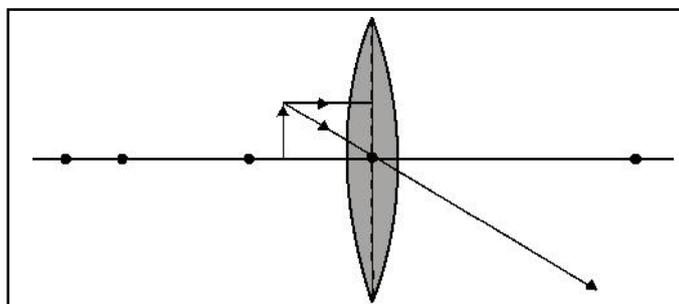
Q.3. Solve the following questions : (Any 5) [15]

- (1) Draw a ray diagram for object position between $2F_1$ and F_1 for a convex lens.
- (2) Doctor has prescribed a lens having power +1.5D. What will be the focal length of the lens? What is the type of the lens and what must be the defect of vision?
- (3) How did Kepler's law help Newton to arrive at the inverse square law of gravity? (To prove $F \propto \frac{1}{r^2}$)
- (4) Explain the types of reaction with reference to oxygen and hydrogen. Illustrate with examples.
- (5) Define :
 - (i) Centre of curvature of a lens
 - (ii) Principal axis of a lens
 - (iii) Optical centre of a lens
- (6) Write a note on Neutralisation Reaction.
- (7) What are the demerits of Mendeleev's periodic table?

Q.4. Solve the following questions : (Any 1) [5]

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

$$\text{SO}_{2(g)} + \text{H}_2\text{S}_{(aq)} \rightarrow \text{S}_{(s)} + \text{H}_2\text{O}_{(l)}$$
 (b) Give a comparative study of all the four-blocks of Modern Periodic table.
- (2) (a) Distinguish between Concave lens and Convex lens.
 (b) Redraw and complete the following diagram of a simple microscope.



- (c) State the Nature of the image.

Best Of Luck 🍀