

MT

2018 ____ 1100

Seat No.

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MT - SCIENCE & TECHNOLOGY - I (72) - SEMI PRELIM - II : PAPER - 2

Time : 2 Hours

(Pages 4)

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:**
In the dispersion of sunlight through a glass prism, the light deviates the most.
- (2) **Name the following:**
The substance in whose presence the rate of a chemical reaction changes without causing any chemical change to it.
- (3) **Find the odd word out:**
Long-sightedness, Myopia, short sightedness, near-sightedness.
- (4) **State whether the following statement is 'True' or 'False'. If false; write the correct statement for the same.**
Isotopes have same atomic masses.
- (5) **Complete the analogy:**
At poles : 9.83 m/s^2 :: At equator :

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

- (1) A chemical reaction involves in
 - (a) only breaking of bonds.
 - (b) only formation of bonds.
 - (c) both breaking and formation of bonds.
 - (d) none of these.

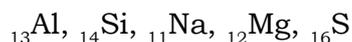
- (2) We can see the sun even when it is little below the horizon because of
- (a) Reflection of light (b) Refraction of light
(c) Dispersion of light (d) Absorption of light
- (3) For a Convex lens if the incident ray is parallel to the principal axis, then the refracted ray passes through the
- (a) Centre (b) Pole
(c) Optical centre (d) Principal focus
- (4) In which block of the Modern Periodic table are the non-metals found?
- (a) s-block (b) p-block
(c) d-block (d) f-block
- (5) 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
- (a) $T^2 \propto r^3$ (b) $T \propto r^3$
(c) $T^2 \propto r$ (d) $T^3 \propto r^2$

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

[10]

- (1) **Explain what happens when following reaction takes place and give the balanced chemical equation :**
Sulphur dioxide and hydrogen sulphide reacts.
- (2) Mahendra and Virat are sitting at a distance of 1 metre from each other. Their mass are 75 kg and 80 kg respectively. What is the gravitational force between them? ($G = 6.67 \times 10^{-11} \text{ Nm}^2/\text{kg}^2$)
- (3) **Distinguish between:** Inert gases and Normal elements
- (4) Draw a ray diagram for object position beyond $2F_1$.
- (5) **Give scientific reason :**
When the gas formed on heating limestone is passed through freshly prepared lime water, the lime water turns milky.

- (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 metallic character?

- (7) 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)

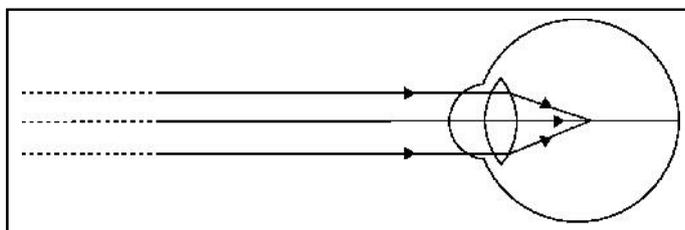
Q.3. Solve the following questions : (Any 5)

[15]

- (1) **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° ?
- State any one phenomena in nature which is based on total internal reflection.
- State any one condition required for total internal reflection.

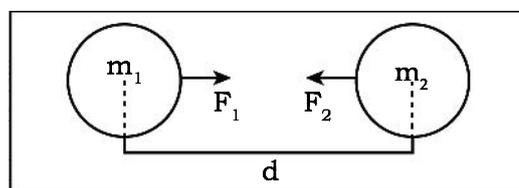
- (2) Given below is a diagram showing a defect of human eye :



Study it and answer the following questions :

- Name the defect shown in figure.
 - Give two possible reasons for this defect of eye in human being.
 - Name the type of lens used to correct the eye defect.
- (3) Write short note on Dispersion of light with a neat labelled diagram.
- (4) What is the reaction called when oxidation and reduction take place simultaneously? Explain with one example.

- (5) Observe the figure and answer the following question:



- (i) What is the relationship between gravitational force and masses?
 - (ii) What is the relationship between gravitational force and distance ?
 - (iii) If the value of G on earth is $6.67 \times 10^{-11} \text{ Nm}^2/\text{kg}^2$, what is its value on the moon?
- (6) Write a note on Endothermic Reaction.
- (7) What is the periodic trend in the variation of valency while going down a group? Explain the answer with reference to group 1, group 2 and group 18.

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

[5]

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

$$\text{H}_2\text{S}_2\text{O}_7(l) + \text{H}_2\text{O}(l) \rightarrow \text{H}_2\text{SO}_4(l)$$
 - (b) What are the factors which affects the rate of a chemical reaction.
- (2) Define : Escape velocity and Prove $V_{\text{esc}} = \sqrt{2gR}$

Best Of Luck 🍀