NEW STANDARD ACADEMY

Marks: 80

Date : 05-05-25 **CLASS : 10TH** **Time: 3 hours.**

PHYSICS

1. A convex mirror used in a bus has radius of curvature 3.5m. If the driver of the bus locates a car at 10.0 m behind the bus ,find the position , Nature and size of the image of the car.
2. A dentist uses a mirror in front of a decayed tooth at a distance of 4cm from the tooth to get a four times magnified image in the mirror .Use mirror formula to find the focal length and nature of the mirror used.
3. An object is placed at distance of 10 cm from a diverging mirror of focal length 15cm .Find the position and nature of the image formed .Also calculate the magnification of the image.
4. An object of 5.0 cm in size is placed at a distance of 20.0 cm from a concave mirror of focal length 15.0 cm .At what distance from the mirror should a screen be placed to get a sharp image? Also calculate size of the image.
5. For an object placed at a distance of 20 cm from the pole of a mirror , an image is formed 40 cm farther from the object on the same side.
   (a) What is the nature of the mirror ? Give reason for your answer
6. Light enters from air to water having refractive index 4/3 . The speed of light in the water is $x \times 10^8$ m/s. Find the value of x? (The speed of light in vacuum is 3×10^8 m s^{-1})
7. An object 5 cm tall is placed 10 cm from a convex mirror of radius of curvature 30 cm. What is the size of the image?
8. Find the position of the image of an object placed at a distance of 25 cm in front of a concave mirror of focal length 50 cm?
9. A 2 cm high object is placed at a distance of 20 cm from a concave mirror. The image is real, inverted and 3 cm in size. Find the focal length of the mirror and the position of the image?
10. Refractive index of water is 4/3. Find the critical angle of water? [$\sin 48^0\ 36' = 0.75$]

CHEMISTRY

1. Is copper more reactive than iron ? Give a reaction in support of your answer.
2. Balance the following chemical equation:
   $Pb(NO_3)_2 \xrightarrow{Heat} PbO(s) + NO_2(g) + O_2(g)$
3. Give two example of oxidant and Reductant
4. Write chemical equation for the reactions taking place when
   (i) Magnesium reacts with dilute HNO_3
   (ii) Sodium reacts with water.
   (iii) Zinc reacts with dilute hydrochloric acid
5. A metal salt MX, When exposed to light splits up to form the metal M and the gasX_2. Metal M is used in making ornaments , whereas gas X_2 is used in making bleaching power. The salt MX is itself used in black and white photography.
   (i) Identify metal M and gasX_2.
6. Translate the following statements into chemical equations , and then balance the equations:
   (i) Phosphorus burns in oxygen to give phosphorus pentoxide.
   (ii) Aluminium metal replaces iron from ferric oxide Fe_2O_3 giving aluminium oxide and and iron.
   (iii) Carbon disulphide burns in air to give carbon dioxide and sulphur dioxide .
   (iv) Barium chloride reacts with zinc sulphate to give zinc chloride and barium sulphate
7. Write one example for each of decomposition reaction
   (i) Electricity (ii) Heat
   (iii) Light
8. Compound A when dissolved in water gives compound B and Liberates heat . Compound A is used in whitewashing .Compound B reacts with $CO_2$to form a white precipitate of compound C. Identify Compounds A,B and C . Also write the equations involved.
9. Based on the reactions given below arrange the metals involved in these reactions in decreasing order of reactivity .Give a suitable explanation.
   (i) $Zn + CuSO_4 \rightarrow ZnSO_4 + Cu$
   (ii) $Cu + 2AgNO_3 \rightarrow Cu(NO_3)_2 + 2Ag$
   (iii) $Zn + FeSO_4 \rightarrow ZnSO_4 + Fe$
   (iv) $Fe + CuSO_4 \rightarrow FeSO_4 + Cu$
10. $N_2 + 3H_2 \rightarrow 2NH_3 \rightarrow$ Name the type of reaction.

BIOLOGY

1. How does afish breath
2. Draw labelled diagram of lungs
3. How do plants respire
4. What is the difference between anaerobic and aerobic respiration
5. Give the five steps of holozoic Nutrition
6. What is the function of salivary amylase
7. What is the function of villi?
8. What is the tidal volume? Explain?
9. What is difference between expiration and inspiration?
10. How you prove CO_2 is a necessary for photosynthesis.

MATH

1. For the following APs, write the first term and the common difference:
   (i) -5,-1,3,7,… (ii) 0.6, 1.7, 2.8, 3.9, …
2. Write first four terms of the AP, when the first term a and the common difference d are gives as follows:
   (i) a = -1, d = $\frac{1}{2}$ (ii) a = $\sqrt{2}$, d = $\frac{1}{\sqrt{2}}$
3. Find the 10th term of the AP : 2, 7, 12, …
4. Find the AP whose nth term is 3n-5.
5. Find the 11th term from the end of the AP:10, 7, 4,.., -62.
6. Determine the AP whose 3rd term is 5 and the 7th term is 9.
7. An AP consists of 50 terms of which the third term is 12 and the last term is 106. Find the 29^{th} term.
8. The sum of the 5th and 9^{th} terms of an AP is 30. If its 25^{th} term is three times its 8^{th} term, find the AP.
9. The eighth term of an AP is half of its second term and 11^{th} term exceeds one third of fourth term by 1. Find the 15th term.
10. In an AP, the pth term is $\frac{1}{q}$ and the qth term is $\frac{1}{p}$. *Find its* (pq)th term