

# NEW STANDARD ACADEMY

Marks: 80

Date : 15-07-24

CLASS : 10<sup>TH</sup>

Time: 3 HRS

## PHYSICS

1. Which spherical mirror is used as a rear view or side view mirror?
2. Find the focal length of a spherical mirror having radius of curvature 30 cm.
3. Draw a ray diagram to show the path of the reflected ray corresponding to an incident ray which is directed parallel to the principal axis of a convex mirror. Mark on it, the angle of incidence (i) and the angle of reflection (r)
4. A ray of light moves from air to an unknown transparent medium. If the angle of incidence is  $45^\circ$  and angle of refraction is  $30^\circ$ , find the refractive index of the unknown substance.
5. How can change of size of eyeball be one of the reason for  
(i) myopic and  
(ii) hypermetropic eye ?  
Compare the size of eyeball with that of a normal eye in each case. How does this change of size affect the position of image in each case?
6. Due to gradual weakening of ciliary muscles and diminishing flexibility of the eyelens a certain defect of vision arises. Write the name of this defect. Name the type of lens required by such persons to improve the vision. Explain the structure and function of such a lens.
7. Name the layers of the boundary of an eye. Give their functions.
8. During the day the sky appears blue. Explain this natural phenomenon.
9. State the cause of dispersion of white light passing through a glass prism. How did Newton show that white light of Sun contains seven colours using two identical glass prisms? Draw a ray diagram to show the path of light when two identical glass prisms are arranged together in inverted position with respect to each other and a narrow beam of white light is allowed to

fall obliquely on one of the focus of the first prism.

10. Describe the formation of rainbow in the sky with the help of a diagram.

## CHEMISTRY

1. Balance the following word –equations
  - i) Potassium chlorate  $\rightarrow$  Potassium chloride + Oxygen
  - ii) Aluminium hydroxide + hydrochloric acid  $\rightarrow$  Aluminium chloride + Water
2. Carbon monoxide and hydrogen combine to form methanol. Write balanced chemical equation with physical states and conditions of reactions.
3. What types of following chemical reactions are?
  - (a) Quicklime reacts with water.
  - (b) Marble (limestone) is heated.
  - (c) Ammonia reacts with hydrogen chloride,
4. Explain the terms oxidation and reduction in terms of (a) oxygen and hydrogen (b) metals and non-metals.
5. What is the electronic configuration of  $N^{3-}$  and  $P^{3-}$  ions?
6. What are organic and mineral acids? Explain with examples.
7. Why does dry HCl gas not change the colour of the dry litmus paper?
8. Classify the following into strong and weak bases:
  - i)  $NH_4OH$
  - ii)  $Cu(OH)_2$
9. Write the names and symbols of the ions present in the aqueous solutions of NaOH,  $NH_4OH$  and  $Mg(OH)_2$ .
10. How many molecules of water of crystallisation are present in one molecule of the following salts?
  - (i) Plaster of Paris
  - (ii) Gypsum
  - (iii) Copper sulphate
  - (iv) Ferrous sulphate
  - (v) Washing soda.

### BIOLOGY

1. A student is observing the temporary mount of a leaf peel under a microscope. Draw labelled diagram of the structure of stomata as seen under the microscope.
2. Why do fishes die when taken out of water?
3. Why is the rate of breathing in aquatic organisms much faster than in terrestrial organisms?
4. Why and how does water enter continuously into the root xylem?
5. Explain the process of nutrition in Amoeba.
6. Why do veins have thin walls as compared to arteries?
7. Draw the structure of a nephron and label the following on it: Glomerulus, Bowman's capsule, Renal artery, Collecting duct
8. What is apical dominance? Which hormone shows antagonistic effect of apical dominance?
9. Name the two hormones secreted by pancreas. Write one function of each hormone named.
10. What is reflex action? Give its two examples. Illustrate the pathway followed by a message from the receptor in a reflex arc.

### MATHS

1. Find the largest number which divides 70 and 125 leaving remainders 5 and 8 respectively.
2. Prove that  $\sqrt{5}$  is an irrational number.
3. If  $\alpha$  and  $\beta$  are zeroes of the polynomial  $p(x) = 2x^2 + 5x + k$  satisfying the relation  $\alpha^2 + \beta^2 + \alpha\beta = \frac{21}{4}$  then find the value of  $k$
4. If  $\alpha$  and  $\beta$  are zeroes of  $x^2 - 2x - 1$ , form a quadratic polynomial whose zeroes are  $2\alpha - 1$  and  $2\beta - 1$ .
5. A two digit number is seven times the sum of its digits. The number formed by reversing the digits is 18 less than the given number. Find the given number.
6. Find the value of  $p$ , for which one root of the quadratic equation  $px^2 - 14x + 8 = 0$  is 6 times the other root.
7. Solve for  $x$ :  $\frac{1}{a+b+x} = \frac{1}{a} + \frac{1}{b} + \frac{1}{x}$ ,  $a \neq 0, b \neq 0, x \neq 0$ .
8. A train travels a distance of 480 km at a uniform speed. If the speed had been 8 km/h less, then it would have taken 3 hours more to cover the same journey. Find the usual speed of the train.
9. In an AP, the  $p$ th term is  $\frac{1}{q}$  and the  $q$ th term is  $\frac{1}{p}$ . Find its  $(pq)$ th term.
10. If two vertices of an equilateral triangle are  $(3,0)$  and  $(6,0)$  find the third vertex.