

NEW STANDARD ACADEMY

Marks: 80

Date : 07-07-25

CLASS : 10TH

Time: 3 hours.

PHYSICS

1. Describe principal focus and focal length of a concave mirror and a convex mirror with the help of suitable diagrams.
2. How many rays of light are generally required to locate the image formed by a mirror? Draw any two such rays of light.
3. A concave mirror of focal length f can form a magnified erect as well as inverted image of an object placed in front of it. Justify this statement stating the position of object with respect to the mirror in each case for obtaining these images.
4. If the image formed by a mirror for all positions of the object placed in front of it is always diminished, erect and virtual, state the type of the mirror and also draw a ray diagram to justify your answer. Write one use such mirrors are put to and why.
5. Name the mirror from the following data:

Position of object	Position of Image	Nature of Image
At Infinity	Behind the mirror at focus	Virtual and erect

6. (i) Write mirror formula.
(ii) What caution is needed to apply this formula?
(iii) What assumption is adopted regarding aperture of the mirror?
Or
Why is some sign convention used while deriving the mirror formula?
7. Under what condition in an arrangement of two plane mirrors, incident ray and reflected ray will always be parallel to each other, whatever may be angle of incidence? Show the same with the help of a diagram.
8. Why does a pencil dipped raised in water appear to be bent?
9. Why does the bottom of a water tank appear raised?
10. Ramesh and Suresh performed an experiment in a group to trace the path of rays refracted through a glass slab. Ramesh finally measured the angle of incidence and emergence. What do you think should be the result if Ramesh performed the experiment correctly?

CHEMISTRY

1. Why do acids not show acidic behaviour in the absence of water?
2. Five solutions A, B, C, D and E when tested with universal indicator showed pH as 4, 1, 11, 7 and 9, respectively. Which solution is
(a) neutral?
(b) strongly alkaline?
(c) strongly acidic?
(d) weakly acidic?
(e) weakly alkaline?
Arrange the pH in increasing order of hydrogen-ion concentration.
3. Equal lengths of magnesium ribbons are taken in test tubes A and B. Hydrochloric acid (HCl) is added to test tube A, while acetic acid (CH₃COOH) is added to test tube B. Amount and concentration taken for both the acids are same. In which test tube will the fizzing occur more vigorously and why?
4. Fresh milk has a pH of 6. How do you think the pH will change as it turns into curd? Explain your answer.
5. A milkman adds a very small amount of baking soda to fresh milk.
(a) Why does he shift the pH of the fresh milk from 6 to slightly alkaline?
(b) Why does this milk take a long time to set as curd?
6. Write the balanced chemical equations for the following reactions.
(a) Calcium hydroxide + Carbon dioxide
Calcium carbonate + Water
(b) Zinc + Silver nitrate
Zinc nitrate + Silver
(c) Aluminium + Copper chloride
Aluminium chloride + Copper
(d) Barium chloride + Potassium sulphate
→ Barium sulphate + Potassium chloride

7. Write the balanced chemical equation for the following and identify the type of reaction in each case.
 - (a) Potassium bromide(aq) + Barium iodide(aq) \rightarrow Potassium iodide(aq) + Barium bromide(s)
 - (b) Zinc carbonate(s) \rightarrow Zinc oxide(s) + Carbon dioxide(g)
 - (c) Hydrogen(g) + Chlorine(g) \rightarrow Hydrogen chloride(g)
 - (d) Magnesium(s) + Hydrochloric acid(aq) \rightarrow Magnesium chloride(aq) + Hydrogen(g)
8. What does one mean by exothermic and endothermic reactions? Give examples.
9. Why is respiration considered an exothermic reaction? Explain.
10. Why are decomposition reactions called the opposite of combination reactions? Write equations for these reactions.

BIOLOGY

1. What is the reflex action give the example
2. Define synapse with diagram
3. How many parts in fore brain in human give the function of these part
4. What is a hind brain give the function of different part of hind brain
5. What is the saprophytic nutrition give the example
6. Draw the label diagram of stomata give its function
7. What is the Holozoic nutrition explain different steps in this nutrition with example
8. Give the 4 main function of liver
9. Why pancreas is the mesocrine gland explain it
10. In human maximum digestion take place in which part of alimentary canal, give the reason

MATHS

1. For which values of a and b does the following pair of linear equations have an infinite number of solutions?
 $2x + 3y = 7$, $(a-b)x + (a+b)y = 3a + b - 2$
2. If $x+1$ is a factor of $2x^3+ax^2+2bx+1$, then find the values of a and b given that $2a-3b = 4$.
3. A fraction becomes $\frac{1}{3}$ when 2 is subtracted from the numerator and it becomes

$\frac{1}{2}$ when 1 is subtracted from the denominator. Find the fraction.

4. If $\frac{1}{2}$ is a root of the equation $x^2+kx-\frac{5}{4}=0$, then the value of k is
5. n^{th} term of an AP is $7n+4$. The common difference is:
6. For what value of k will the consecutive terms $2k+1$, $3k+3$ and $5k-1$ form an AP?
7. If the 10^{th} term of an AP is 52 and the 17^{th} term is 20 more than the 13^{th} term, find the AP.
8. If the sum of the first n terms of an AP is $3n^2+n$ and its common difference is 6, then its first term is:
9. The sides of a right-angled triangle are in AP. Show they are in the ratio 3:4:5.
10. The first term of an AP is 5 and the last term is 45. If the sum of all the terms is 400 the number of terms is :