NEW STANDARD ACADEMY

PHYSICS

1. Give a relation for electric current in terms of electric charge on an electron.
2. Define electric current.
3. What is the direction of conventional current?
4. Define resistance.
5. Name the device used to measure current.
6. The length of copper wire is 100m and its radius is 1 mm .Calculate its resistance if resistivity of copper is $1.72 \times 10^{-8} \Omega m$.
7. The resistance of 1m of nichrome wire is 6Ω.Calculate its resistance if its length is 70cm.
8. Two wires made of german –silver are taken such that the length and area of cross – section of the second wire are twice and thrice ,respectively , those of the first wire. If the resistance of the second wire is 12Ω, find the resistance of the first wire.
9. An electric bull whose resistance is 60Ω *is connected to a* source of potential difference of 230 V. find the current flowing through if
10. Study the following circuit diagram find the potential difference provided by the cell.
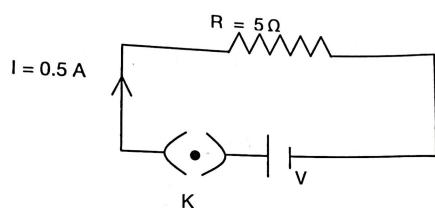
CHEMISTRY

1. Name one metal and one non-metal that exist in a liquid state at room temperature. Also, name two metals having a melting point less than 310 K (37°C).
2. A metall A, which is used in the thermite process, when heated with oxygen gives an oxide B, which is amphoteric in nature. Identify A and B. Write down the reactions of oxide B with HCl and NaOH.
3. An element A reacts with water to form a compound B, which is used in whitewashing. Heating the compound B forms an oxide C, which, on treatment with water, gives back B. Identify A, B and C and give the reactions involved.
4. What is the reactivity series of metals? Rearrange the following metals in an increasing order of reactivity: Aluminium, Zinc, Mercury and Gold.
5. A solution of $CuSO_4$, was kept in an iron pot. After a few days, the iron pot was found to have a number of holes in it. Explain the reason in terms of reactivity. Write the equation of the reaction involved.
6. (A) Show the formation of sodium oxide (Na_2O) and magnesium oxide (MgO) by the transfer of electrons.
   (B) Name the ions present in these compounds.
7. A non-metal A is an important constituent of our food and forms two oxides, B and C. Oxide B is toxic, whereas C causes global warming.
   (i) Identify A, B, and C.
   (ii) To which group of periodic table does A belong?
8. Iqbal treated a lustrous, divalent element M with sodium hydroxide. He observed the formation of bubbles in reaction mixture. He made the same observations when this element was treated with hydrochloric acid. Suggest how can he identify the produced gas. Write chemical equations for both the reactions.
9. Giving one example of each, explain the method of obtaining the following metals from their compounds.
   Metal 'A' - Placed low in the activity series.
   Metal 'B' - In the middle in the activity series.
   Metal 'C' - Towards the top of the activity series.
10. Complete reaction
   (a) $Al_2O_3 + NaOH \rightarrow$
    (b) $ZnO + HCl \rightarrow$

BIOLOGY

1. What are phytohormones?
2. Which type of movement is shown by the leaves of touch-me-not' plant when touched?

3. What are the two main constituents of central nervous system?
4. Write the function of thyroxin hormone in our body.
5. Which hormone helps in lowering the level of blood glucose in human beings?
6. Which hormone is responsible for the development of moustache and beard in men?
7. Which hormone is used for artificial ripening of fleshy fruits?
8. Name the plant hormone which causes stem elongation and leaf elongation.
9. Compare and contrast the nervous and hormonal mechanisms for control and coordination in the animals.
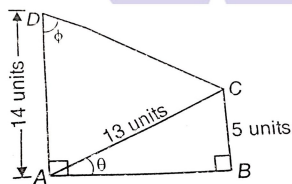10. Differentiate between tropic and nastic movements in plants.

MATHS

1. In $\Delta\ OPQ\ right\ angle\ at\ P, OP = 7\ cm$ and $OQ - PQ = 1cm\ (see\ figure)$

   Find the sinQ ,cosQ
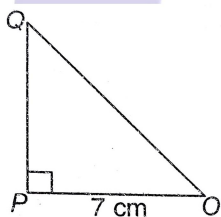
2. In the given figure $\angle ABC = 90°. \angle BAC = \theta, \angle ADC = \phi$, BC=5 units AC =13 units and AD =14 units Also $\angle BAD = 90°$.

   Find the tanϕ,cosϕ

3. If Cos A $= \frac{4}{5}$,then the value of tan A,sin A is

4. If 7 tan θ =4 then find the value of 4 $\frac{7\sin\theta - 3\cos\theta}{7\sin\theta + 3\cos\theta}$

5. $\left[\frac{3}{4}tan^2 30° - sec^2 45° + sin^2 60°\right]$ is equal to

6. $Verify\ that$
   (i) $Sin 60° = \frac{2\tan 30°}{1+tan^2 30°} = \frac{\sqrt{3}}{2}$
   (ii) $\cos 60° = \frac{1-tan^2 30°}{1+tan^2 30°} = \frac{1}{2}$

7. Shown in fig are two right triangles find the length of the unknown side marked ? show your work
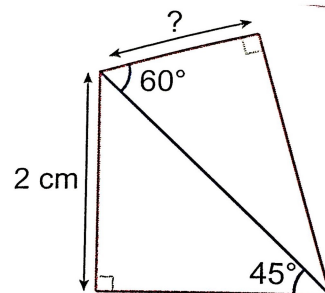
8. In an acute $\Delta\ ABC$ sin (A+B-C) = $\frac{1}{2}$, $cot\ (A - B + C) = 0\ and \cos(B + C - A) = \frac{1}{2}$.
   $What\ are\ the\ values\ of\ A, B\ and\ C?$

9. If sec A $= \frac{17}{8}$, $then\ show\ that\ \frac{3-4sin^2 A}{4cos^2 A - 3} = \frac{3 - tan^2 A}{1 - 3\ tan^2 A}$.

10. If sec A $= \frac{5}{4}$, $then\ verify\ that\ \frac{3\sin A - 4\sin^3 A}{4\cos^3 A - 3\cos A} = \frac{3\tan A - tan^3 A}{1 - 3tan^2 A}$.