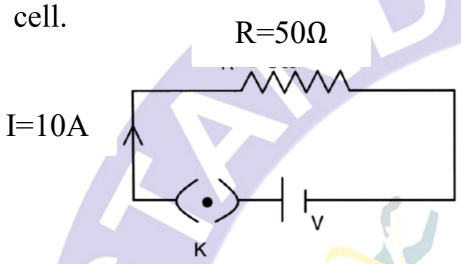
NEW STANDARD ACADEMY

Marks: 80

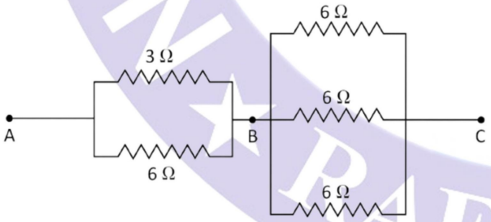
Date : 13-07-2026 **CLASS : 10TH** **Time: 3 hours**

PHYSICS

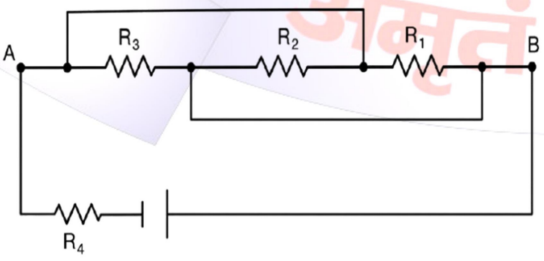
1. An electric bulb whose resistance is 60Ω is connected to a source of potential difference of 230 V. Find the current flowing through it.
2. Study the following circuit diagram Find the potential difference provided by the cell.



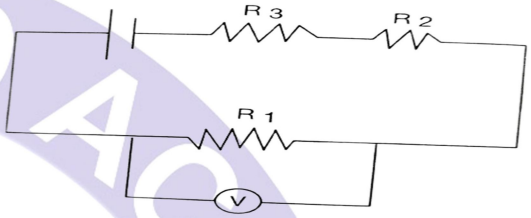
3. Find the effective resistance, when 1 Ω, 10 Ω and 4 Ω resistances are connected in parallel,
4. Find the equivalent resistance when 3 ohm and 6 ohm resistances are connected in series.
5. For the given circuit, find the effective resistance between
   (i) A and B (ii) B and C
   (iii) A and C



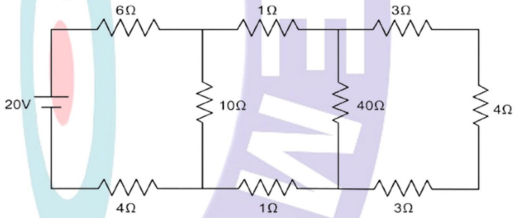
6. Find the current through the resistor R_4 if $R_1 = R_2 = R_3 = 20\Omega$, $R_4 = 40\Omega$. The emf of the battery is 4 V.



7. Three resistors R_1, R_2, R_3 of which $R_1 = 20\ \Omega$, $R_2 = 20\ \Omega$, $R_3 = 30\Omega$ connected to a battery of emf 24 V as shown in the figure. If the resistance of the voltmeter is 20 Ω, find the reading of the voltmeter.



8. Two bulbs 60 W, 220 V and 100 W, 220 V are con-nected in series to a 440 V supply. Which of the two bulbs fuses? What happens if these bulbs are con-nected in parallel?
9. In the given circuit, find the power dissipated in the 6 Ω resistance.



10. Arrange the following steps to determine the resistiv-ity of a material in proper sequence.
    (A) Switch on the circuit and take the voltmeter and ammeter readings.
    (B) Determine the resistance of the wire as resistance R = V/I
    (C) Connect the wire, battery and ammeter in series.
    (D) Determine the length (*l*) and area of cross-section (A) of the wire
    (E) Connect a voltmeter across the wire.
    (*f*) The resistivity of the material is ρ = RA/1

CHEMISTRY

1. Metal compound A reacts with dilute hydrochloric acid to produce effervescence. The gas evolved extinguishes a burning candle. Write a

balanced chemical equation for the reaction if one of the compounds formed is calcium chloride?

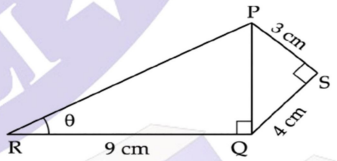
2. How is the concentration of hydroxide ions OH^- affected when excess base is dissolved in a solution of sodium hydroxide?
3. You have two solutions, A and B. The pH of solution A is 6 and pH of solution B is 8. Which solution has more hydrogen ion concentration? Which of this is acidic and which one is basic?
4. 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?
5. 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 (CH_3COOH) 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?
6. Compounds such as alcohols and glucose also contain hydrogen but are not categorised as acids. Describe an Activity to prove it.
7. Under what soil condition do you think a farmer would treat the soil of his fields with quick lime (calcium oxide) or slaked lime (calcium hydroxide) or chalk (calcium carbonate)?
8. Why should curd and sour substances not be kept in brass and copper vessels?
9. You have been provided with three test tubes. One of them contains distilled water and the other two contain an acidic solution and a basic solution, respectively. If you are given only red litmus paper, how will you identify the contents of each test tube?
10. Write word equations and then balanced equations for the reaction taking place when -
    (a) dilute sulphuric acid reacts with zinc granules.
    (b) dilute hydrochloric acid reacts with magnesium ribbon.
    (c) dilute sulphuric acid reacts with aluminium powder.
    (d) dilute hydrochloric acid reacts with iron filings.

BIOLOGY

1. What is the main structural and functional difference between macronutrients and micronutrients?
2. Give name and function of four digestive enzyme?
3. What is the metabolic function of glycogen, and where is it primarily stored?
4. What is the difference between water-soluble and fat-soluble vitamins regarding body storage and toxicity risk?
5. What role does dietary fiber play in human digestion if our bodies cannot actually digest it?
6. What is test cross, give example?
7. Explain the difference between an organism's genotype and its phenotype.
8. What is allels?
9. Why are X-linked recessive disorders (like hemophilia or red-green color blindness) much more common in biological males than females?
10. What is genetics, and define gene?

MATHS

1. In the adjoining figure, PS = 3cm QS = 4cm $\angle PRQ = \theta$, $\angle PSQ = 90°$ PQ $\perp$ RQ and RQ = 9cm Evaluate tan θ.



2. If A = 60° and B = 30° verify that
   (i) sin(A + B) = sin A cos B + cos A sin B
   (iii) tan(A - B) = $\frac{\tan A - \tan B}{1 + \tan A \tan B}$
3. If cosec $\theta = x + \frac{1}{4x}$, Prove that cosec $\theta + cot\theta = 2x \; or \; \frac{1}{2x}$
4. If x = h + a cos θ and y = k + a sin θ prove that $(x - h)^2 + (y - k)^2 = a^2$
5. $(\cot A + \sec B)^2 - (\tan B - \operatorname{cosec} A)^2 = 2(\cot A \sec B + \tan B \operatorname{cosec} A)$.
6. If tan θ +cot θ=5 find the value of $\tan^2\theta + \cot^2\theta$.
7. Evaluate the following
   $$\frac{2(cos^2 45° + tan^2 60°) - 6(sin^2 45° - tan^2 60°)}{tan30° + cot60°}$$

8. (i) (secA + tan A)(1 - sin A) = cos A
   (ii) $(1 + \tan^2 A)(1 - \sin A)(1 + \sin A) = 1$
9. $2\sec^2\theta - \sec^4\theta - 2\,\mathrm{cosec}^2\theta + \mathrm{cosec}^4\theta = \cot^4\theta - \tan^4\theta$
10. $\sqrt{\frac{\sec A - 1}{\sec A + 1}} + \sqrt{\frac{\sec A + 1}{\sec A \quad 1}} = 2\,cosec\,A$