

NEW STANDARD ACADEMY

Marks: 80

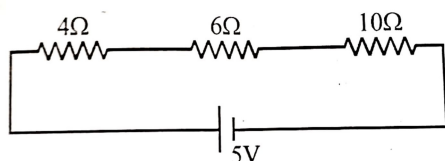
Date : 12-08-24

CLASS : 10TH

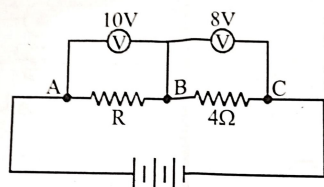
Time: 3 HRS

PHYSICS

1. A bulb is rated 40 W, 220V Find the current drawn by it when it is connected to a 220 - V supply
2. A bulb is rated 60 W, 240 V Calculate its resistance when it is on. If the voltage drops to 192 V, what will be the power consumed and the current drawn
3. Name the device used to measure potential difference. How is it connected in electric circuit?
4. How much current will flow through a resistor of resistance 12W if a Battery of 18V is connected across it?
5. Calculate the potential difference across each resistor in the circuit shown in figure.

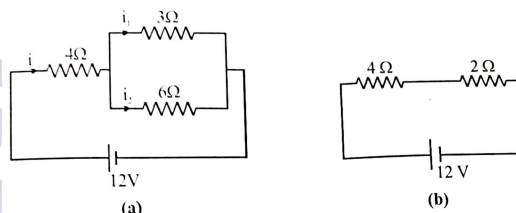


6. A uniform wire of resistance R is cut into three equal pieces, and these pieces are joined in parallel. What is the resistance of the combination?
7. Consider the circuit shown in figure the voltmeter on the left reads 10V and that one the right read 8V. find (a) the current through the resistance R,(b) the value of R and (c) the potential difference across the battery.



8. Three resistors of resistances 10 Ω, 20Ω And 30 Ω are connected in parallel with a 6V cell. Find (a) the current through each resistor, (b) the current supplied by the cell ,and (c) the equivalent resistance of the circuit.

9. Consider the circuit shown in figure. Calculate the current through the 3 Ω resistor.



10. How will you join three resistors of resistances 4 Ω, 6 Ω and 12 Ω to get an equivalent resistance of 8 Ω?

CHEMISTRY

1. Write the dot structure of chloride and oxide ion.
2. Why does aluminium not react with water to produce H₂ under ordinary conditions?
3. An element (X) forms an oxide X₂O₃ which dissolves in an acid . Explain whether the element (X) is metal or non- metal?
4. Between copper and sodium which metal is more reactive ? Explain with reasons.
5. Aqueous solutions of FeSO₄, ZnSO₄, MgSO₄ and AgNO₃ are taken separately. In each solution copper strip is added. Which solution becomes blue?
6. Which metal does not give H₂ gas with steam and dilute acids.
7. What is aqua regia ? What is its nature?
8. Which of the following elements form acidic, basic or amphoteric oxides ? Na, Zn, C, S, Al, K, Mg
9. Why do iron nails get a coating of red-brown colour when placed in a solution of CuSO₄?
10. Why does copper wire begins to shine when placed in a solution of AgNO₃?

BIOLOGY

1. If a trait A exists in 10% of a population of an asexually reproducing species and a trait B exists in 60% of the same population, which trait is likely to have arisen earlier?

- How do Mendel's experiments show that traits may be dominant or recessive?
- How do Mendel's experiments show that traits are inherited independently?
- Give the pair of contrasting traits of the following characters in pea plant and mention which is dominant and recessive?
 - Yellow seed
 - Round seed
- Why did Mendel choose pea plant for his experiments?
- Mendel crossed a pure tall pea plant (TT) with a pure short pea plant (tt) and obtained all tall plants in F₁ generation?
 - What is the gene combination present in the plants of F₁ generation?
 - Give reason why only tall plants are observed in F₁ progeny.
 - What will be the ratio of the plants obtained in the F₂ generation when F₁ plants are self pollinated?
- A pea plant with blue colour flower denoted by BB is cross-breed with a pea plant with white flower denoted by ww
 - What is the expected colour of the flowers in their F₁ progeny?
 - What will be the percentage of plants bearing white flower in F₂ generation, when the flowers of F₁ plants were self cross?
 - State the expected ratio of the genotype BB and Bw in the F₂ progeny
- What is test cross? How does it differ from a reciprocal cross?
- Explain Mendel's law of segregation.
- What is dihybrid cross? Mention an example.

MATHS

- If $\tan \theta = \frac{1}{\sqrt{5}}$, find the value of $\frac{\operatorname{cosec}^2 \theta - \sec^2 \theta}{\operatorname{cosec}^2 \theta + \sec^2 \theta}$
- If $\cot \theta = \frac{15}{8}$, then evaluate $\frac{(2+2 \sin \theta)(1-\sin \theta)}{(1+\cos \theta)(2-2 \cos \theta)}$
- Prove that
 - $(\operatorname{cosec} A + \cot A)(1 - \cos A) = \sin A$
 - $\sec A(1 - \sin A)(\sec A + \tan A) = 1$
- Prove the following
 - $1 + \frac{\cot^2 \alpha}{1 + \operatorname{cosec} \alpha} = \operatorname{cosec} \alpha$
 - $(\sin \alpha + \cos \alpha)(\tan \alpha + \cot \alpha) = \sec \alpha + \operatorname{cosec} \alpha$
- Prove the following identities:

- $\frac{\sin \theta}{1 + \cos \theta} + \frac{1 + \cos \theta}{\sin \theta} = 2 \operatorname{cosec} \theta$
- Prove the following $2(\sin^6 \theta + \cos^6 \theta) - 3(\sin^4 \theta + \cos^4 \theta) + 1 = 0$
 - Prove that $\frac{1}{1 + \sin^2 \theta} + \frac{1}{1 + \cos^2 \theta} + \frac{1}{1 + \sec^2 \theta} + \frac{1}{1 + \operatorname{cosec}^2 \theta} = 2$
 - Find the value of: $\frac{\sin \theta}{\sec \theta + \tan \theta - 1} + \frac{\cos \theta}{\operatorname{cosec} \theta + \cot \theta - 1}$
 - Prove the following $\frac{\sin \theta - \cos \theta + 1}{\sin \theta + \cos \theta - 1} = \frac{1}{\sec \theta - \tan \theta}$
 - Prove the following $\sqrt{\frac{\sec A - 1}{\sec A + 1}} + \sqrt{\frac{\sec A + 1}{\sec A - 1}} = 2 \operatorname{cosec} A$