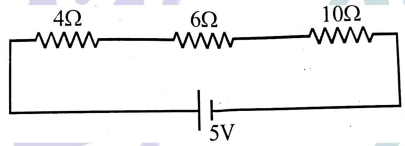
NEW STANDARD ACADEMY

Marks: 80

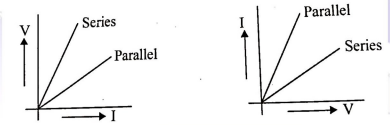
Date : 05-08-24 **CLASS : 10th** **Time: 3 HRS**

PHYSICS

1. An electric iron of resistance 20 Ω takes a current of 5A. Calculate the heat developed in 30 seconds
2. How can three resistors of resistance 2 Ω, 3 Ω , and 6 Ω be connected to give a total resistance of (a) 4Ω, (b) 1 Ω?
3. How much work will be done in bringing a charge of 5.0 millicoulombs from infinity to a point P at which the potential is 12 V?
4. How much current will flow through a resistor of resistance 12Ω if a battery of 18 V is connected across it?
5. Calculate the potential difference across each resistor in the circuit shown in figure.



6. Calculate the wattage of an electric heater which draws 5A current when connected to a 220V power supply.
7. A bulb draws 24 W when connected to a 12 V supply. Find the power if it is connected to a 6 V supply. (Neglect resistance change due to unequal heating in the two cases.)
8. Two students perform the experiments on series and parallel combinations of two given resistors R_1 and R_2 and Plot the following V-I graphs.



Which of the graphs is (are) correctly labelled in terms of the word 'series' and 'parallel'.Justify your answer.

9. Define '1volt' state the relation between work , charg and potential difference for an electric circuit. Calculate the potential difference between two terminals of the battery if 100 J of work is required to transfer 20 C of charge from one terminal of the battery to the other.
10. List in a tabular form two differences in between a voltmeter and an ammeter

CHEMISTRY

1. A magnesium ribbon is burnt in oxygen to give a white compound X accompanied by emission of light. If the burning ribbon is now placed in an atmosphere of nitrogen, it continues to burn and forms a compound Y.

   a) Write the chemical formulae of X and Y.

   b) Write a balanced chemical equation, when X is dissolved in water.

2. Zinc liberates hydrogen gas when reacted with dilute hydrochloric acid, whereas copper does not. Explain why?

3. During the reaction of some metals with dilute hydrochloric acid, the following observations were made:

   a) The temperature of the reaction mixture rises when aluminium (Al) is added.

   b) Some bubbles of a gas are seen when lead (Pb) reacts with the acid.

   Explain these observations giving suitable reasons.

4. A silver article generally turns black when kept in the open for a few days. The article when rubbed with toothpaste again starts shining.

   a) Why do silver articles turn black when kept in the open for a few days? Name

the phenomenon involved.
b) Name the black substance formed and give its chemical formula.

5. On heating blue-coloured powder of copper
(II) nitrate in a boiling tube, copper oxide (black), oxygen gas and a brown gas X is formed.
(A) Write a balanced chemical equation of the reaction.
(B) Identify the brown gas X evolved.
(C) Identify the type of reaction.
(D) What could be the pH range of aqueous solution of the gas X?
6. Give the chemical name of the compound present in tooth enamel. What is the nature of this compound?
7. What happens when nitric acid is added to egg shell?
8. Plaster of Paris should be stored in a moisture-proof container. Explain why?
9. Salt (A) commonly used in bakery products on heating gets converted into another salt (B) which itself is used for removal of hardness of water and a gas (C) is evolved. The gas (C) when passed through lime water, turns it milky. Identify (A), (B) and (C).
10. How would you distinguish between baking powder and washing soda by heating?

BIOLOGY

1. What is Heredity.
2. Define Genetics Who is the father of Genetics
3. Define Variations.
4. Define a gene
5. What is monohybrid cross. ?
6. Define Back cross and Test cross.
7. What is dihybrid cross. ?
8. Define phenotype and Genotype. ?
9. What is Homozygous traits & Heterozygous traits.
10. Why mendel select Pea plant.

MATH'S

1. In ΔABC, right angled at B, AB = 24 cm and BC = 7 cm. Determine:
sin A, cos A
2. Given sec $\theta = \frac{13}{12}$, calculated all other trigonometrical ratios.
3. If sin A = $\frac{3}{4}$, find cos A and tan A
4. If tan A = $\frac{3}{4}$, then show that sinA cos A = $\frac{12}{25}$.
5. If tan $\theta = \frac{a}{b}$,prove that $\frac{a\sin\theta - b\cos}{a\sin\theta + b\cos} = \frac{a^2-b^2}{a^2+b^2}$.
6. Find the value of the following:
Sin60°cos30°+sin30°cos60°
7. Show that :$\frac{2tan30°}{1+tan^2 30°}$ =sin60°
8. Find the value of the following:
$2\sqrt{2}$cos45°cos60° + $2\sqrt{3}$sin30°tan60°-cos0°
9. If tan $\theta = \sqrt{3}$, find the value of $\frac{2\sec\theta}{1+tan^2\theta}$.
10. If secθ. sin $\theta = 0$,then the value of cos θ is