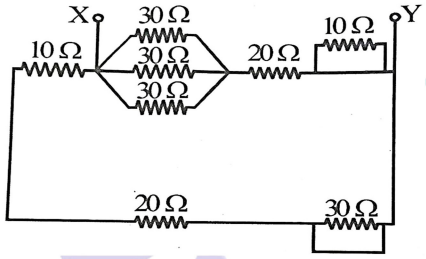
NEW STANDARD ACADEMY

Marks: 80

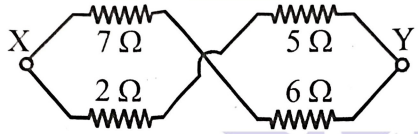
Date : 20-08-24 **CLASS : 10TH** **Time: 3 HRS**

PHYSICS

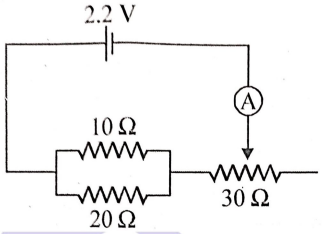
1. You are given n identical wires, each of resistance R. When these are connected in parallel ,the equivalent resistance is X. When these will be connected in series then the equivalent resistance will be:
2. There resistors of 4.0Ω, 6.0 Ω and 10.0 Ω are connected in series. What is their equivalent resistance
3. If one micro-amp. current is flowing in a wire, the number of electrons which pass from one end of the wire to the other end in one second is:
4. Resistance R, 2 R, 4R, 8 R, are connected in parallel. Their resultant resistance will be:
5. The equivalent resistance between points X & Y :



6. The equivalent resistance between points X & Y :



7. 2 points A and B are at electric potentials 10 V and 100 V respectively. A charge q is taken from A to B and 18 joule of work is done. The value of q is:
8. The resistance of rheostat shown in the figure is 0-30Ω. Neglecting the resistance of ammeter and connecting wire the minimum and maximum currents through the ammeter will be:



9. An electric heater of resistance 500 ohm is connected to a main supply for 30 minutes. If 5 A current flows through the filament of the heater, calculate the heat energy produced in the heater
10. The length of copper wire is 100 m and its radius is 1 mm. Calculate its resistance if resistivity of copper is 1.72×10 Ω-m

CHEMISTRY

1. An element (X) froms an oxide X_2O_3 which dissolves in an acid. Explain whether the element (X) is metal or non-metal?
2. There are three metals – Na Mg and Ag. Suggest two chemical reactions which confirm their positions in activity series of metals.
3. Between copper and sodium which metal is more reactive? Explain with reasons.
4. What are the main points of difference in the physical and chemical properties of metals and non- metals?
5. What happens when (i) potassium reacts with cold water (ii) iron reacts with steam.
6. What happens when Na, Mg, Fe and Al react with chlorine?
7. Describe basic acidic and amphoteric oxides with examples

8. Differentiate between the physical and chemical properties of metals and non-metals.
9. Complete and balance the following equations.
   a) $Mg+HNO_3 \rightarrow$
   b) $Na_2O+ H_2O \rightarrow$
   c) $Mg+HNO_3 \rightarrow$
   d) $MgO+ H_2O \rightarrow$
10. Write the electron dot structures of NaCl, Na_2O, $MgCl_2$,MgO,CaO, $CaCl_2$.

BIOLOGY

1. Differentiate between inherited and acquired traits. Give one example of each type.
2. A Mendelian experiment consisted of breeding pea plants bearing violet flower with pea plants bearing white flower. What will be the result in F_1 progeny?
3. A man with blood group 'A' marries a woman with blood group 'O' and their daughter has blood group 'O'. Is this information enough to tell you which of the trait blood group 'A' or 'O' is dominant?
4. How is the sex of the child determined in human beings?
5. In pea, a pure tall plant (TT) is crossed with a short plant (tt) .What is the ratio of pure tall plants to short plants in F_2 generation?
6. What do you mean by sex determination?
7. How many contrasting traits were selected by Mendel?
8. Explain Sex chromosome and Autosome.
9. Explain incomplete Dominance.
10. If a round, green seeded pea plant (RR yy) is crossed with wrinkled, yellow seeded pea plant(rrYY). Which type seeds are produced in F_1 generation?

MATHS

1. Express the trigonometric ratios sin A, sec A and tan A in terms of cot A.
2. Prove the following :
   $(\sin\theta +\cos\theta + 1)\ (\sin\theta -1+\cos\theta)$
   $\sec\theta\ cosec\theta = 2$
3. Prove the following identities:
   a) $(\text{cosec}\theta - \cot)^2 = \frac{1-cos\theta}{1+cos\theta}$
   b) $\frac{1+sec}{secA} = \frac{sin^2A}{1-cosA}$
4. Prove that
   $\frac{tan^3\theta}{1+tan^2\theta} + \frac{cot^3\theta}{1+cot^2\theta} = \sec\theta cosec\theta - 2sin\theta cos\theta$
5. *If* $\sin\theta +\cos\theta = \sqrt{2}$, then prove that $\tan\theta+\cot\theta=2$.
6. *If* $cosec\ \theta = x + \frac{1}{4x}, prove\ that\ cosec\ \theta+\cot\theta = 2x\ or\ \frac{1}{2x}$
7. *If* $x = a\cos\theta + b\ sin\ \theta\ and\ y = a\sin\theta - \cos\theta$, prove that $x^2+y^2=a^2+b^2$.
8. *If* $\tan\theta + sin\theta = m\ and\ \tan\theta - \sin\theta = n$, then prove that $m^2-n^2 = 4\sqrt{mn}$.
9. $\frac{tan^2A}{tan^2A-1} + \frac{cosec^2A}{sec^2A-cos^2A} = \frac{1}{1-2cos^2A}$
10. $(\cot A + \sec B)^2-(\tan B-\text{cosec } A)^2= 2(\cot A \sec B + \tan B \text{ cosec } A)$