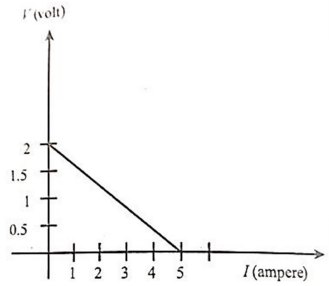
NEW STANDARD ACADEMY

Marks: 60

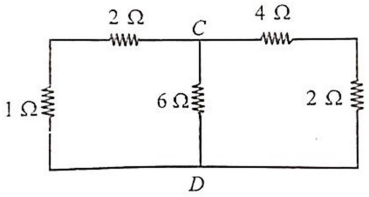
Date : 01-07-24 **CLASS : 12TH NEET** **Time: 3 HRS**

PHYSICS

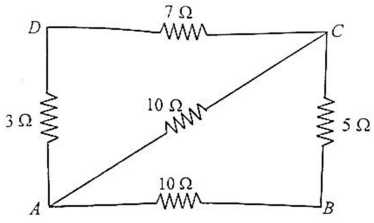
1. For a cell, the graph between the potential difference (V) across the terminals of the cell and the current (1) drawn from the cell is shown in figure. The emf and internal resistance of the cell, respectively, are



2. Equivalent resistance between points C and D in the combination of resistance shown is

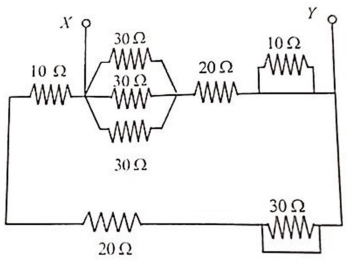


3. Five resistances are connected as shown in the adjoining figure. The equivalent resistance between A and B is

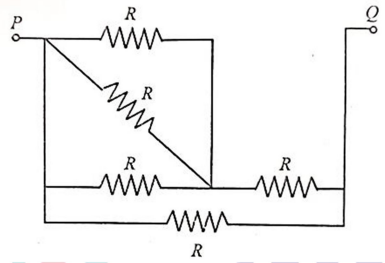


4. A copper wire of resistance R is cut into 10 parts of equal lengths. Two pieces each are first joined in series and then five such combinations are joined in parallel. The new combination will have a resistance

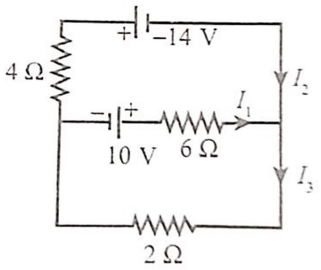
5. Net resistance between X and Y is



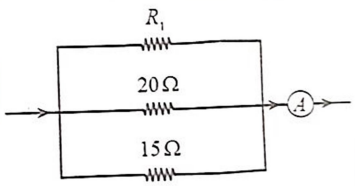
6. If the equivalent resistance between the terminal point P and Q is 4Ωin the given circuit ,then find out the resistance of R in ohms



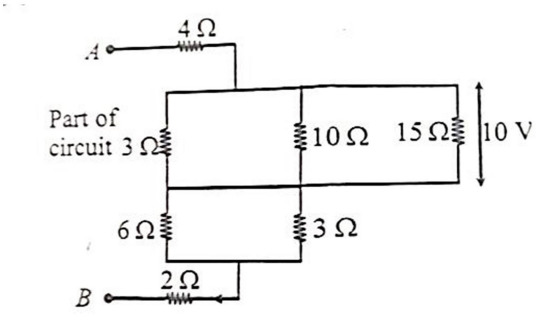
7. For the circuit shown below, let I_1, I_2 *and* I_3 be the currents marked in respective branches. Then



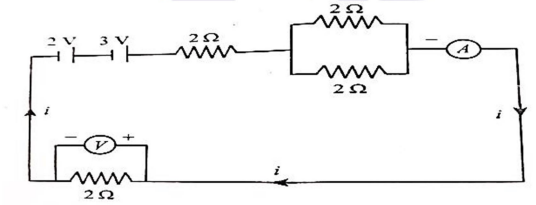
8. In The given circuit, the current flowing through the resistance 20Ω is 0.3 A, while the ammeter reads 0.8 A.What is the value of R_1?



9. Calculate the potential difference between points A and B and the current flowing through the 10Ω resistor in the part of the circuit shown below.



10. Reading of ideal ammeter in ampere for the following circuit is



CHEMISTRY

1. Write chemical equations involved in the preparation of $KMnO_4$ from MnO_2.
2. How will you convert pot. Permanganate to Manganese dioxide?
3. What happen when dil. NaOH solution is added to a solution of $K_2Cr_2O_7$ in water ?
4. Complete the following equations:
   (a) $2MnO_4^- + 5SO_3^{2-} + 6H^+ \rightarrow$
   (b) $Cr_2O_7^{2-} + 6Fe^{2+} + 14H^+ \rightarrow$
5. Give relationship between the equivalent weight and molecular weight of $KMnO_4$.
   a) Acidic medium.
   b) Neutral medium
   c) Alkaline medium
6. What are lanthanides and actinides? Why are these called inner transition or *f*-block elements?
7. What is lanthanide contraction? What is its cause and what are its consequences?
8. The elements of 3d transition series are given:
   Sc Ti V Cr Mn Fe Co Ni Cu Zn
   . Answer the following
   (i) Write the element which shows maximum number of oxidation states. Give reason.

   (ii) Which element has the highest m.p?

   (iii) Which element shows only + 3 oxidation state?

   (iv) Which element is a strong oxidizing agent in +3 oxidation state and why?

9. MnO_2 is fused with KOH in the presence of KNO_3 as an oxidizing agent, it gives a dark green compound (A) Compound (A) disproportionate in acidic solution to give a purple compound (B). An alkaline solution of compound (B) oxidises Kl to (C) whereas an acidified solution of compound (B) oxidises Kl to (D). Identify (A), (B), (C) and (D).
10. How would you account for the following?
    (i) Cr^{2+} is reducing in nature while with the same d-orbital configuration (d^4) Mn^{3+} is an oxidising agent.

BIOLOGY

1. How has the bacterium Bacillus thuringiensis helped us in controlling caterpillars of insect pests?

2. What is organic farming? Why is it suggested to switch over to organic farming?

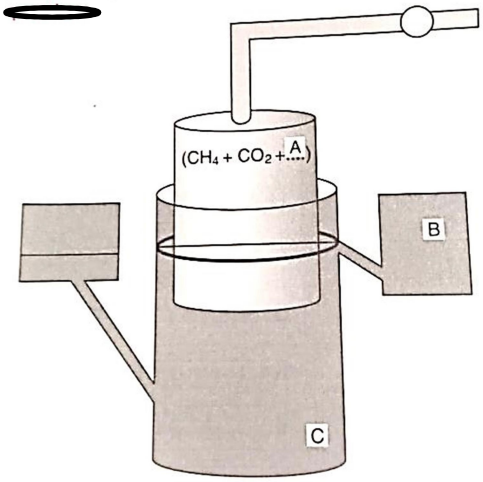
3. Name a free-living and a symbiotic bacterium that serves as biofertiliser. Why are they called so?

4. Name the enzyme produced by Streptococcus bacterium Explain its importance in medical sciences.
5. Name the source of cyclosporin A. How does this bioactive molecule function in our body?
6. How are floes produced in the secondary treatment plant of the sewage? Explain their role.

7. What are methanogens? How do they help to generate biogas?
8. Write the most important characteristic that Aspergillus niger, Clostridium butylicum and Lactobacillus share

9. What would happen if a large volume of untreated sewage is discharged into a river?

10. Study the figure given below and answer the following questions.



(a) What is shown in the diagram?
(b) Name the agencies which produced this technology in India
(c) What are A, B and C?