

NEW STANDARD ACADEMY

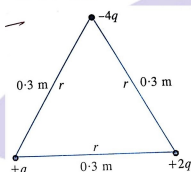
Date : 30-06-25

CLASS : 12TH NEET

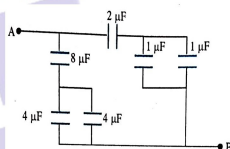
Marks: 60
Time: 3 hours.

PHYSICS

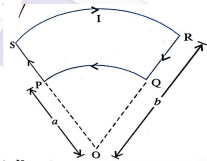
- Three point charges are arranged at the three vertices of a triangle as shown in Fig. Calculate the electrostatic potential energy of the system if $q = 3 \times 10^{-7} \text{ C}$



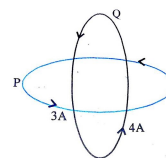
- Two positive point charges of $0.2 \mu\text{C}$ and $0.01 \mu\text{C}$ are placed 10 cm apart. Calculate the workdone in reducing the distance by 5 cm .
- 27 spherical drops of radius 3 mm and carrying 10^{-12} C of charge are combined to form a single drop. Find the capacitance and potential of bigger drop.
- What is the area of the plates of a 2 microfarad parallel plate air capacitor, given that the separation between the plates is 0.5 cm ?
- Find the equivalent capacitance between points A and B



- In the Bohr model of hydrogen atom, an electron revolves around the nucleus in a circular orbit of radius $5 \times 10^{-11} \text{ m}$ with a frequency $7 \times 10^{15} \text{ Hz}$. What is the magnetic field set up at the centre of orbit?
- A current loop having two circular segments and joined by two radial lines. Find the magnetic field at centre O



- Two identical loops P and Q each of radius 5 cm are lying in perpendicular planes such that they have a common Centre as shown. Find the magnitude and direction of the net magnetic field at the common centre of two coils, if the coils carry currents equal to 3 A and 4 A respectively.



- An electron moving with a speed of 10^8 m s^{-1} enters a magnetic field of $5 \times 10^{-3} \text{ T}$ in a direction perpendicular to the field. Calculate (i) radius of the path (ii) frequency of revolution of the electron.
- A straight wire of mass per unit length 0.100 g cm^{-1} carries current 5.00 A horizontally to the south. Find the magnitude of the minimum magnetic field required to lift the wire vertically upward.

CHEMISTRY

- State and explain Raoult's Law for a binary solution of two volatile liquids.
- Differentiate between molarity and mole fraction. Which one is temperature-dependent and why?
- Why is the elevation in boiling point a colligative property? Give the mathematical expression.
- What is the relationship between Gibbs free energy (ΔG) and cell potential (E_{cell})? Give the formula.
- Why does conductivity of a solution decrease with dilution, but molar conductivity increases?
- Calculate the molar conductivity of a solution if conductivity (κ) = $1.5 \times 10^{-2} \text{ S cm}^{-1}$ and concentration = 0.05 mol L^{-1} .
- Calculate the emf of a cell at 298 K :
 $\text{Zn} | \text{Zn}^{2+} (0.1 \text{ M}) || \text{Cu}^{2+} (1 \text{ M}) | \text{Cu}$
($E^\circ_{\text{cell}} = 1.10 \text{ V}$)
(Use Nernst equation and $\log 10 = 1$)
- For a reaction, the rate is given by $\text{Rate} = k[\text{A}][\text{B}]^2$. What will be the effect on the rate if: (a) $[\text{A}]$ is doubled, (b) $[\text{B}]$ is halved?
- For a first-order reaction, the time taken to reduce the concentration to half is constant. Prove it mathematically.
- The rate constant of a reaction doubles when temperature increases from 300 K to 310 K . Calculate the activation energy (E_a). ($R = 8.314 \text{ J/mol}\cdot\text{K}$)

BIOLOGY

1. Why is double fertilization unique to angiosperms? Explain the process briefly.
2. What is the function of tapetum in the anther? Why is it considered important?
3. How is cleistogamy an adaptation for self-pollination? Mention one disadvantage.
4. What are apomictic seeds? How are they formed without fertilization?
5. Explain the significance of endosperm formation before embryo development in angiosperms.
6. Differentiate between spermatogenesis and spermiogenesis.
7. Explain the role of Sertoli cells in the male reproductive system.
8. Describe the role of LH and FSH in females during the menstrual cycle.
9. Explain the roles of oxytocin and relaxin during parturition.
10. Define implantation. On which day of the menstrual cycle does it usually occur?

