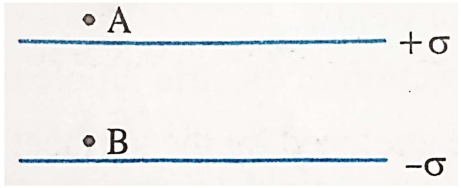
NEW STANDARD ACADEMY

Semri Kothi Super Market, Raebareli

CLASS 12 (Academy) 21-04-2025

PHYSICS

1. A charge Q μC is placed at the centre of a cube. What is the flux coming out of any one surface?
2. A charge 'q' is placed at the centre of cube of side *l*. What is the electric flux passing through each face of cube ?
3. A charge 'q' is placed at the centre of a cube of side 1. What is the electric flux passing through two opposite faces of the cube?
4. Two plane sheets of charge densities + σ and – σ are kept in air as shown in Fig. What are the electric field intensities at points A and B ?



5. An electric dipole of dipole moment 20×10^{-6} Cm is enclosed by a closed surface. What is the net flux coming out of the surface?

CHEMISTRY

1. Calculate the EMF of the electrode $Zn|Zn^{2+}$ (0.1M) at 298 K. Given that $E°_{(zn)} = -0.76$ V.
2. Calculate the EMF of Cu | $CuSO_4$ (0.1M). The salt is 90% dissociated. Given that $E°\ (Cu^{2+} | Cu) = +0.34$ V.
3. Calculate the EMF of the cell at 25° C.
   Cu $|Cu^{2+}$ (4M)$||Ag^{+}$ (0.1M)| Ag
   Given that $E°\ (Cu^{2+} / Cu) = 0.34$V and $E°\ (Ag^{+} |Ag) = 0.80$ V
4. Calculate the EMF of the cell :
   $Cr|Cr^{3+}$ (0.1M)$||Fe^{2+}$ (0.01M)| Fe
   Given that $E°(Cr^{3+}|Cr) = -0.75$Vand
   $E°\ (Fe^{2+} | Fe) = -0.45$ V
5. For the cell reaction given below EMF at 25 °C is 1.3 V.
   $Zn(S) + Cu^{2+}(1M) \rightleftharpoons Cu(S) + Zn^{2+}(0.1M)$
   Calculate E° of the cell reaction.

BIOLOGY

1. Animals which have both male and female sex organs in the same individuals are known as
2. Name some hermaphrodite animals.
3. Name the accessory genital glands in human male .
4. What is mesovarium?
5. Name the accessory structures of female reproductive system.
6. How do leydig cells help in spermatogenesis?
7. What are primary sex organs ?
8. Name three phases of gametogenesis
9. Give the term for the change of a spermatid into a sperm?
10. What is the source of sheath in middle piece of a sperm?

MATH

1. Solve $\begin{vmatrix} x & a & a \\ a & x & a \\ a & a & x \end{vmatrix} = 0$
2. Solve the equation: $\begin{vmatrix} x+a & x & x \\ x & x+a & x \\ x & x & x+a \end{vmatrix} = 0, a \neq 0$
3. By using properties of determinants show that
   : $\begin{vmatrix} x+4 & 2x & 2x \\ 2x & x+4 & 2x \\ 2x & 2x & x+4 \end{vmatrix} = (5x+4)(4-x)^2$
4. By using properties of determinants show that :
   $\begin{vmatrix} a-b-c & 2a & 2a \\ 2b & b-c-a & 2b \\ 2c & 2c & c-a-b \end{vmatrix} = (a+b+c)^3$
5. Find the value of the determinant $\begin{vmatrix} 1 & 1 & 1 & 1 \\ 1 & 2 & 3 & 4 \\ 1 & 3 & 6 & 10 \\ 1 & 4 & 10 & 20 \end{vmatrix}$
6. In a triangle ABC , If a,b,c are the side opposite to angle A,B,C respectively , then find the value of $\begin{vmatrix} b\cos C & a & c\cos B \\ c\ cosA & b & a\ cosC \\ a\ cosB & c & b\ cosA \end{vmatrix}$.
7. Let $|A| = |a_{ij}|_{3\times 3} \neq 0$ Each element a_{ij} is multiplies k^{i-j}. Let |B| the resulting determinant, where $k_1|A| + k_2|B| = 0$. Then the value of $k_1 + k_2$ is
8. Find the value of a and b if the system of equations, $a^2x - by = a^2 - b$ and $bx - b^2y = 2 + 4b$
   (i) possess unique solution
   (ii) infinite solutions
9. Consider the system of equations $2x+py+6z = 8$; $x+2y+qz = 5$; $x+y+3z = 4$, then find the value of p and q if
   (a) System has no solution (b) System has a unique solution
10. If $2ax - 2y + 3z = 0$, $x + ay + 2z = 0$ have a non – trivial solution then find the value of a.