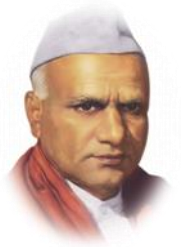

"ज्ञान, विज्ञान आणि सुसंस्कार यासाठी शिक्षण प्रसार"

शिक्षणमहर्षी- डॉ .साळुंखे बापूजी

Shri Swami Vivekanand Shikshan Sanstha's

Dattajirao Kadam Arts, Science & Commerce College, Ichalkaranji

DEPARTMENT OF PHYSICS

QUESTION BANK

B.Sc. Part-I, Semester-II, PHYSICS Paper- III

DSC- B ELECTRICITY AND MAGNETISM-I

❖Long answer questions

1. State and prove Gauss' divergence theorems in vector field.
2. What is electric dipole? Obtain an expression for electric potential due to electric dipole, at a point at a distance r from the centre of the dipole.
3. Explain dielectric polarization and thereby show that, for a parallel plate capacitor completely filled with dielectric, the electric displacement vector is given by the relation, $\vec{D} = \epsilon_0 \vec{E} + \vec{P}$.
4. Obtain an expression for electric potential due to point charge at a distance r from it.
5. Obtain an expression for electric field at a point outside the charged spherical shell.
6. Obtain an expression for electric field at a point outside the charged sphere.
7. Obtain an expression for capacitance of a parallel plate capacitor.
8. Obtain an expression for capacitance of a spherical condenser.
9. Obtain an expression for capacitance of a cylindrical condenser.
10. Explain dielectric polarization.

Short answer type questions

1. Define and discuss curl of a vector field.
2. State and explain Stoke's theorem.
3. Explain the physical significance of the gradient of a scalar function.
4. Find an expression for electric field at a point outside the charged sphere.
5. Define electric field and electric potential. Establish a relation between them.
6. Show that the energy stored per unit volume in electrostatic field is $\frac{1}{2} \epsilon_0 E^2$.
7. Define scalar or dot product of two vectors. State its characteristics.

8. Write a note on del operator.
9. State some characteristics of cross product of two vectors.
10. Define the curl of a vector field. Obtain an expression for it.
11. Explain electric flux of electric field.
12. Calculate the workdone in placing a charge of 8×10^{-18} C on a condenser of capacity 100 μF.