INTERNAL TEST Total Marks – 12

Name of the Paper : Electricity and Magnetism

Name of Course : B.Sc (H) PHYSICS

Duration : 1 Hours

Instruction for Candidate

1) Question No. 1 is Compulsory
2) Attempt any one Questions in others.

Question – 1) (a) State and Prove Uniqueness Theorem. (3)

(b) The Electric potential at any point in x-y plane is given by $V = 8x(x^2+y^2)^{1/2} + y(x^2+y^2)^{-1/2}$. Find the Cartesian Component of electric field intensity at that point. (3)

Question – 2(a) Derive Sol^n of laplace eq^n in Cartesian Co-ordinates. (3)

b) The electric potential at any point in a plane is given by $V(r,\theta) = a\frac{\cos\theta}{r^2} + \frac{b}{r^2}$. Find the Component of E_r and E_θ. (3)

Question – 3(a) State and prove Gauss Divergence Theorem Show that $\nabla \cdot E = \rho/\varepsilon_0$ (3)

3(b) A spherical charge distribution has a volume charge density $\rho(r) = \rho_0\left(1 - \frac{r}{R}\right)$ when $r \le R$ $\rho(r) = 0$ when $r > R$. Find the Electrostatic Potential inside, outside and on the surface of the charged sphere. (3)