J.C. Bose University of Science & Technology YMCA, Faridabad

1st Sessional Examination

B.Tech (Mechanical ME 21/ ME 22) 2nd semester

Introduction to Electromagnetic Theory (BSC-101 A)

Time: 1hr 30 min. **M. Marks: 15**

Note: All questions are compulsory.

Q. 1 (a) Explain the divergence and curl of electrostatic field. (2)

(b) Write Poisson's and Laplace's equations in electrostatics. (2)

(c) Define magnetic dipole. (1)

Q. 2 (a) Derive an expression for electric field due to an electric dipole. (3)

(b) A long straight wire, carrying uniform line charge λ, is surrounded by rubber insulation out to a radius a. Find electric displacement vector. (2)

Q. 3 (a) Given the potential $V = 2x^2y-5xz$; find V and E at point P (-4, 3, 6). (2.5)

(b) A zero potential reference is at r =10 m and point charge of $Q = 0.5\times10^{-9}$ C is placed at origin. Find potential at r = 5 m and r = 15 m. (2.5)