Department of Electronics & Communication Engineering

Faculty of Engineering, Integral University, Lucknow

Assignment Sheet 1

Electromagnetic Field Theory (IEC-302)

Faculty : Shrish Bajpai

Problems : 15

Section : Unit 1 (Vector Algebra, Vector Calculus & Electrostatic Fields)

Due Date : August 19, 2014

1. Given the vector $\vec{A} = [\{(\cos x)(\sin y)\}\vec{a}_x + \{(\sin x)(\cos y)\}\vec{a}_y]$. Calculate curl of $\vec{A}$.
2. If $\vec{E} = [-\{2y^3 - 3yz^2\}\vec{a}_x - \{6xy^2 - 3xz^2\}\vec{a}_y + \{6xyz\}\vec{a}_z]$ is the electric field in a source free region, find valid expression for the electrostatic potential.
3. It is given that $\vec{F} = \{z\vec{a}_x + x\vec{a}_y + y\vec{a}_z\}$. If S represents the portion of the sphere $x^2 + y^2 + z^2 = 1$ for z≥1 then $\int_S \{\nabla * \vec{F}\}.\overrightarrow{dS}$ is

Solve the problems 1.16, 1.19, 1.23, 2.9, 2.21, 2.28, 2.39(II), 2.41(c), 3.10, 3.28, 3.32 & 3.36 of "Elements of Electromagnetics", 4th Edition by M. N. O. Sadiku, Oxford University Press. India. (TBS 621.34 SAD/P).