BHARATI VIDYAPEETH COLLEGE OF ENGINEERING FOR WOMEN ,PUNE

SE-II(E & TC) - (2010-11 SEM II)

UNIT TEST-I

SUB: EM **MARKS:30** **TIME:1 hr** **Dt.12/2/11**

Q.1) A)What are charge distribution .derive an expression of electric field intensity due to surface charge 9M

B)Determine the total charge

1)on the line $0<x<5m$ if $\rho = 12\ x^2$ c/m

2) on the cylinder $\rho = 3$, $0 \leq z < 4m$ if $\rho_s = \rho_z^{\ 2}$ n c/m^3

3) within the sphere r=4m if $\rho_v = 10/r \sin$ c/m^3 9M

Or

Q.2) a)Explain application of Gauss's low in detail due to point charge 9M

b)the point charge $q1 = 10^{-6}$ c, $q2 = -10^{-6}$ c and $q3 = 0.5 * 10^{-6}$ c are located in air at the corners of the equilateral tringle of 50 cm side.Determine the magnitude and direction of the force on q3. 9m

Q.3) a) State and explain Coulombs low. 6m

b) Obtain expression for D due to point charge located at the origin. 6m

Q.4) a) State and explain Gauss's low.

b)Derive an expression for electric field intensity due to infinite line charge. 8M

BHARATI VIDYAPEETH COLLEGE OF ENGINEERING FOR WOMEN ,PUNE

SE-II(E & TC) - (2010-11 SEM II)

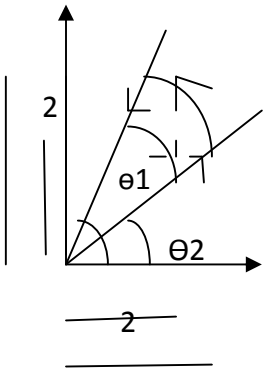
UNIT TEST-II

SUB: EM **MARKS:30** **TIME:1 hr** **Dt.10/3/11**

Q.1) Solve the Laplace equation for the potential field in the homogeneous region between two concentric conducting sphere with radii a and b. b>a if v=0 at r=a find the capacitance between the two concentric spehere 10 M

Q.2)If a= ρ cosϕ a_ρ +sinϕ a_ϕ evaluate ∫A.Dl around path shown in fig confirm this using Stokes theorem 10 M

5



ɵ1=30

Ɵ2=60

or

Q.3) Define work done and potential difference explain relationship between E & V.

Q.4) Derive an expression for energy density in electric field

Q.5)derive an expression for poission and Laplace eqution. 20M

Q.6)A point charge of 5 n c is located at the origin if v=2v at(0,6,8) find:

1) potential at A(-3,2,6) 2)B(1,5,7) 3)potential difference V_{AB} 10M

Q.7)Derive an expression for capacitance of co-axial cable and Spherical capacitor. 10M

BHARATI VIDYAPEETH COLLEGE OF ENGINEERING FOR WOMEN ,PUNE

SE (E & TC) - (2010-11 SEM II)

UNIT TEST-I

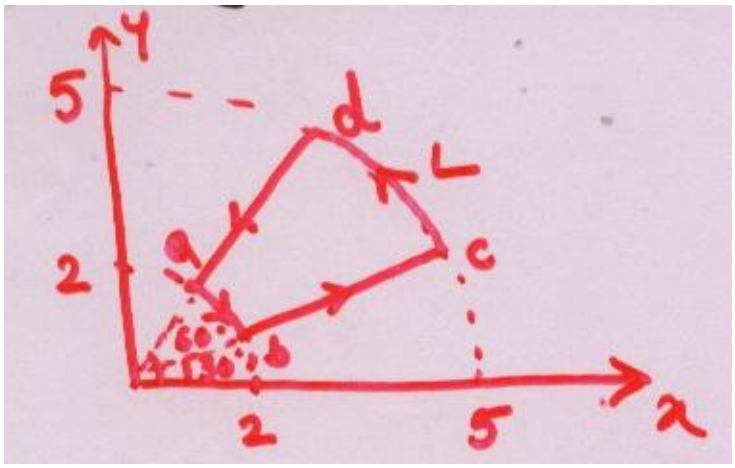
SUB: EM **MARKS:30** **TIME:1 hr**

Q.1 State & prove divergence theorem. 8M

Q.2 If G(r) = 10e^-2z(□a□+az) Determine the flux Of G out of the entire surface of the cylinder r=1,0<=z<=1. Confirm the result by using divergence theorem. 10M

OR

Q.3 If A= □ cosφa□+ sinφaφ. Evaluate φA.dl around the path shown in fig confirm this by using stokes theorem. 10M



Q.4 Determine divergence & curt of following (any two) 12M

1. P=x^2yzax+xzaz

2. $Q=\sin\varphi a_r+2z a_\varphi+z\cos\varphi a_z$

3. $T=1/r^{*}2\ \cos\theta a_r+r\sin\theta\cos\varphi a_\theta+\cos\theta a_\varphi$

BHARATI VIDYAPEETH COLLEGE OF ENGINEERING FOR WOMEN ,PUNE

SE (E & TC) - (2010-11 SEM II)

UNIT TEST-II

SUB: EM **MARKS:30** **TIME:1 hr**

Q.1 State & explain Biot-Savert law. 6M

Q.2 Using Laplace equation, derive the expression for the capacitance or spherical capacitor which is located along z-axis with inner sphere of radius 'a' & outer sphere of radius 'b'. Assume V=Vo at r=a & V=0 at r=b. 8M

OR

Q.3 Using Laplace equation, derive the expression for the capacitance of co-axial cable which islocated along z-axis with inner conductor of radius 'a' and outer conductor of radius 'b'. Assume V=Vo at r=a and V=0 at r=b. 8M

Q.4 Define work done & potencial difference. Explain relationship between

E & V. 6M

Q.5 State and explain the scalar and vector magnetic potential. 4M

Q.6 Obtain H' due to infinite long straight Conductor carrying current I at any point P(r,θ,φ) using Ampere's circuital law. 6M