Reg. No. :

Question Paper Code:93305

B.E. / B.Tech. DEGREE EXAMINATION, AUGUST 2021

Third Semester

Electrical and Electronics Engineering

19UEE305 FIELD THEORY

(Regulation 2019)

Duration: 1:45 hour   Maximum: 50 Marks

PART A - (10 x 2 = 20 Marks)

(Answer any ten of the following questions)

1.	Explain the terms differential length and differential surface in cylindrical coordinate system	CO1 U
2.	Explain the terms solenoidal and irrotational as applied to vector F	CO1 U
3.	Write the theorem which converts surface integral into volume integral	CO1 R
4.	What are the operations you can do with del operator?	CO1R
5.	Define Electric Field Intensity	CO2 R
6.	What is the difference between electric flux density and Current density	CO2 A
7.	Identify the law which is used in electrostatic to determine the electric field intensity between two point charges and explain the same	CO2 A
8.	Write the point form of ohms	CO2 R
9	State the difference between Electric field intensity and Magnetic field intensity and also state the relation between intensity and density	CO3 U
10	Determine the magnitude of the magnetic field of a wire loop at the center of the circle with radius R and current I.	CO3 U
11	State ampere circuital law	CO3 R
12	Contrasts Transformer EMF and Motional EMF	CO4 R
13	State Poynting theorem and Skin Depth	CO4 R
14	For time varying field write the Maxwell equation which is derived from ampere circuital law	CO5 R
15	Find the maximum torque on a 100 turn square loop of a wire of 10 cm on a side that carries 15 A of current in a 2 tesla field.	CO6 A

(Answer any three of the following questions)

16. Determine the curl and divergence of the given vector field $P = x^2yz\ a_x + xz\ a_z$ CO1- U   (10)

17. Four point charges of 10μC each are placed at the corners of square of side   CO2- U   (10)
    1m. Determine the value of the charge that is to be placed at the centre of the
    square so that this system of charges is brought to equilibrium

18. Apply Biot Savart law and find the magnetic field intensity at the point p   CO3- E   (10)
    located in y axis from distance r from the origin, for infinite long straight
    conductor placed in Z axis

19. Elucidate the force acting on a carrying conductor subject to Magnetic Field,   CO5- U   (10)
    and Torque on current carrying loop subjected to magnetic field with the
    example of working of a motor

20. With necessary explanation, derive the Maxwell's equation in differential and   CO6- U   (10)
    integral forms for dynamic fields

93305