SANT GADGE BABA AMRVATI UNIVERSITY, AMRAVATI
Summer Examination 2020 Credit Point
HVPM's College of Engineering and Technology, Amravati
Department of Electronics & Tele communication Engineering
Bachelor of Engineering Sem.:- III

Subject:-ELECTROMAGNETIC FIELDS **Code: - 3ET5**

Instructions:-

1) **Solve any two questions**
2) **All question carry equal marks**

Q1

a) State and Explain strokes theorem and prove it. 02 Credit Point

b) Derive an expression for electric field intensity at any point due to an infinite line charge with line charge density 02 Credit Point

c) State and explain magnetic dipole and magnetization. 01 Credit Point

d) State ampere's circuital law and Derive maxwel's fourth equation in differential and integral form. 02 Credit Point

e) Explain the concept of skin depth. 01 Credit Point

f) Derive the expression for radiation resistance for a signal radiated by an elementary doubled. 02 Credit Point

Q2

a) A vector field is given by G = yzax + xzay + xyaz show that it is both irrotational and solenoidal. 02 Credit Point

b) Define the term i) electric dipole ii)polarization 01 Credit Point

c) Derive an expression for magnetic field intensity at any point due to an finite current carrying conductor. 02 Credit Point

d) Derive a boundary condition for dielectric conducting material interface. 01 Credit Point

e) Derive the electromagnetic wave equation for wave propogation in perfect conducting medium 02 Credit Point

f) Derive the expression for power density if an oscillating electric dipole is placed along z axis 02 Credit Point

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Q3

a) Define the term i) Divergence ii) Gradient iii) Curl. 02 Credit Point

b) State and prove Ampere's law of forces 01 Credit Point

c) State and explain magnetic flux and flux density 02 Credit Point

d) Derive Maxwell's second equation in differential and integral form. 01 Credit Point

e) Derive the electromagnetic wave equation for wave propagation in lossy dielectric medium 02 Credit Point

f) Derive the expression for power radiated and radiation resistance due to half wave dipole — 02 Credit Point

Q4

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a) Convert the given point p(1,3,6) to spherical coordinate system. — 02 Credit Point

b) State and prove Gauss's Law. — 01 Credit Point

c) Derive an expression for magnetic field intensity at any point due to an infinite current carrying conductor. — 02 Credit Point

d) Derive a boundary condition for magnetic material interface. — 01 Credit Point

e) Derive an expression for reflection coefficient and transmission coefficient for E and H fields when an electromagnetic wave is incident normally on the boundary separating two different perfectly dielectric media. — 02 Credit Point

f) Explain the concept of — 02 Credit Point

i) Magnetic scalar potential.

ii) Magnetic vector potential

iii) Retarded potential.