Code No: RT21025 **R13** SET - 1

II B. Tech I Semester Supplementary Examinations, Oct/Nov- 2017
ELECTRO MAGENETIC FIELDS
(Electrical and Electronics Engineering)

Time: 3 hours Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answer **ALL** the question in **Part-A**
3. Answer any **THREE** Questions from **Part-B**

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PART –A

1.	a)	Write the expression for Maxwell's first law	(3M)
	b)	State properties of conductor and dielectric materials.	(4M)
	c)	Define magnetic flux and flux density	(4M)
	d)	What is Lorentz force equation for a moving charge? Write its applications.	(4M)
	e)	Compare self-inductance and mutual inductance	(4M)
	f)	Define Poynting vector.	(3M)

PART –B

2.		Define the potential difference and absolute potential. Give the relation between potential and field intensity.	(16M)
3.	a)	Derive an expression for capacitance of co-axial cable.	(8M)
	b)	Derive an expression for potential due to infinite uniformly charged line and also derive potential due to electric dipole.	(8M)
4.	a)	State Ampere's circuital law and explain any two applications of Ampere's Circuital law	(8M)
	b)	Obtain the expression for magnetic field intensity due to infinite long straight carrying a steady current I.	(8M)
5.		Derive the expression for the torque experienced by a current carrying loop, placed in a magnetic field.	(16M)
6.	a)	Derive the mutual inductance between an infinite long straight wire and a one-turn rectangular coil whose plane passes through the wire and two of whose sides are parallel to the wire.	(8M)
	b)	A solenoid of 8cm in length consists of 800 turns having the cross sectional radius of 1.5 cm. Determine the inductance of solenoid. What is the value of current required to maintain a flux of 1.2 milli-wb in the toroid with $\mu_r = 1200$.	(8M)
7.	a)	Explain (i) Conduction Current. (ii) Displacement current.	(9M)
	b)	Derive the Maxwell's four equations for time varying fields.	(7M)
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