Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M.E –IIst SEMESTER–EXAMINATION – JULY- 2012

Subject code: 1723106 **Date: 12/07/2012**

Subject Name: Electromagnetic Compatibility

Time: 10:30 am – 13:00 pm **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1	**(a)**	Define Noise and Interference. Explain the concept of EMC using typical noise path.	**04**
	(b)	Describe effect of shield on Electric field coupling.	**04**
	(c)	"To prevent radiation of magnetic field from a conductor grounded at both ends, the conductor should be shielded and the shield should be grounded at both ends" Justify the statement with necessary derivations.	**06**
Q.2	**(a)**	Discuss the effect of shield on magnetic field coupling. Explain how magnetic coupling between shield and inner conductor affect the noise voltage above shield cut-off frequency.	**07**
	(b)	Describe the concept of ground system. What is signal ground and safety ground? How equipotential concept and current path concept define a ground? How these concepts are useful?	**07**
		OR	
	(b)	Explain single point, multipoint and hybrid ground systems. What is ground loop? How it can be overcome?	**07**
Q.3	**(a)**	Explain the concept of near field and far field from EMC point of view.	**07**
	(b)	Describe the absorption loss in detail.	**07**
		OR	
Q.3	**(a)**	Describe the Reflection loss. Derive equation for Reflection loss for plane waves.	**07**
	(b)	Using low frequency analysis, explain how common mode choke can be useful against ground loops.	**07**
Q.4	**(a)**	Write a short note on noise sources in SMPS.	**07**
	(b)	Discuss how power line filters can provide protection against differential mode and common mode noise.	**07**
		OR	
Q.4	**(a)**	Explain the basic scheme and working principle of power line filters. Assuming the L value how you will design the coil.	**07**
Q.4	**(b)**	Write a short note on Line Impedance Simulation Network (LISN).	**07**
Q.5	**(a)**	Discuss the glow discharge and arc discharge in detail.	**07**
	(b)	Explain the ESD protection considerations you will keep in mind while designing equipment.	**07**
		OR	
Q.5	**(a)**	Explain contact protection fundamentals briefly.	**07**
	(b)	Explain the concept of ESD using human body model. Define the terms: static discharge and decay time.	**07**

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