

**GUJARAT TECHNOLOGICAL UNIVERSITY****M. E. - SEMESTER – II • EXAMINATION – WINTER • 2013****Subject code: 1723106****Date: 02-01-2014****Subject Name: Electromagnetic Compatibility****Time: 10.30 am – 01.00 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) Explain the need of designing for EMC during equipment development cycle. **07**
- (b) Explain the concept of Radiated and conducted emission. Specify the technical standard limits of interference level for each of them. **07**
- Q.2** (a) Draw & Explain the typical noise path for any circuit. **07**
- (b) Explain the concept of hybrid ground. **07**
- OR**
- (b) Briefly discuss safety ground systems. **07**
- Q.3** (a) State the assumptions made for cabling. Derive the equation of noise induced due to capacitive coupling between two cables. **07**
- (b) Prove that Because of skin effect, at high frequencies, a coaxial cable behaves as a triaxial cable.” **07**
- OR**
- Q.3** (a) Prove that ”For good electric field shielding, it is necessary (1) to minimize the length of the center conductor that extends beyond the shield and (2) to provide a good ground on the shield.” **07**
- (b) Explain the effect of shield on magnetic coupling. **07**
- Q.4** (a) Write a short note on Arc discharge. **07**
- (b) Discuss Electric and magnetic field reflection loss. **07**
- OR**
- Q.4** (a) Prove that magnetic fields are harder to shield against than electric fields. **07**
- (b) Explain the contact protection fundamentals. **07**
- Q.5** (a) Prove that “In digital circuits, to minimize the total inductance, two conductors that carry current in the same direction (such as two ground conductors) should be separated. However, two conductors that carry current in the opposite direction (such as power and ground, or signal and ground conductors) should be placed as close together as possible.” **07**
- (b) Explain ESD protection in Equipment design. **07**
- OR**
- Q.5** (a) Write a short note on decoupling capacitors. What is need of Bulk decoupling capacitor? **07**
- (b) What is LISN? How it is works? **07**

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