

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**
