

M.E DEGREE EXAMINATIONS: NOV/DEC 2012

Third Semester

COMMUNICATION SYSTEMS

COM520 : Electromagnetic Interference & Compatibility In System Design

Time: Three Hours

Maximum Marks: 100

Answer all the Questions:-

PART A (10 x 2 = 20 Marks)

1. Define electromagnetic compatibility.
2. Explain the units of measurements of EMI/EMC?
3. What are transient noises?
4. Differentiate common mode and differential mode signal.
5. Give the limits for conducted emissions under MIL-STD-461D?
6. Why generally a RS test is not performed in an OATS environment?
7. What is electrical bonding?
8. List the EMI mitigation techniques?
9. Define skin depth.
10. List out the ways to minimize noise generated by internal noise sources in a PCB.

PART B (5 x 16 = 80 Marks)

11. a) (i) Explain the natural sources of EMI that affects the Equipment Under Test? (6)
- (ii) Explain in detail the how conducted EMI is measured using Paul Hardin network. (10)

(OR)

- b) (i) Explain why charge accumulation and discharge takes place in a human body and draw its equivalent circuit. (12)
- (ii) Discuss about the importance of measuring noise in frequency domain. (4)
12. a) How cables are affected when they are placed close to each other, discuss with necessary diagrams.

(OR)

- b) What is a common mode choke? Explain its working for common mode and differential mode signal.

13. a) (i) Describe how radiated emission and radiated susceptibility test measurement is done using anechoic chamber. (10)
(ii) Explain how EFT immunity test is carried out experimentally. (6)

(OR)

- b) Establish the relationship between TAF and AF and show that
 $TAF \text{ (dB/m)} = 20 \log f \text{ (MHz)} - 20 \log D \text{ (m)} - AF \text{ (dB/m)} - 31.998$.

14. a) Discuss in detail how EUT is protected from EMI by shielding the equipment.

(OR)

- b) (i) What is the need for grounding? List the methods of grounding and advantages of each method? (10)
(ii) Explain the power line filter design in detail. (6)

15. a) Describe the internal noises that occur in a digital circuit printed circuit board and also give the ways of minimizing it.

(OR)

- b) Explain how noise from power distribution system gets coupled and its decoupling methods, and also explain how PCBs are designed to reduce EMI.
