

B.TECH DEGREE EXAMINATION- 2012

MODEL QUESTION

Sixth Semester

Branch: Electronics and Communication Engineering

EC010 606 L03- HIGH SPEED DIGITAL DESIGN

(Regular)

Time: Three Hours

Maximum: 100 Marks

PART A

*Answer **all** questions briefly.*

Each question carries 3 marks.

1. Differentiate between lumped and distributed systems with an example.
2. Comment on the self inductance of probe ground loops.
3. Write a note on RC transmission lines.
4. What are the relevant electrical properties of vias.
5. What is the need for a stable voltage reference in the power system of high frequency digital circuits?

(5x3=15 marks)

PART B

*Answer **all** questions.*

Each question carries 5 marks.

6. Explain how the following are related with reference to high speed digital circuits:
 - (a) Frequency and Time.
 - (b) Time and Distance.
7. How do rise time and bandwidth affect the performance of oscilloscope probes?
8. What are the different forms of transmission lines? What are the different characteristics of an ideal transmission line at high speeds?
9. Briefly describe the different characteristics of source and middle terminators.
10. What are the factors that need to be considered while choosing a bypass capacitor for the power wiring in high speed digital design?

(5x5=25 marks)

PART C

*Answer any **one** question from each module.*

Each question carries 12 marks.

11. Explain the four different circuit concepts that differentiate between high frequency and low frequency digital circuits. Highlight their step response and mention how they are related to cross talk.

OR

12. Elaborate on the different kinds of powers that arise when logic gates work at high speeds.
13. Explain in detail the special types of probing fixtures that can overcome the problems of ground loop inductance and shunt capacitance.

OR

14. Discuss the problems of point-to-point wiring at high frequencies. Which is a better medium of communication at such high frequencies?
15. Explain the importance of lossy and low-loss transmission lines in the study of high speed circuits. Support your explanation with necessary equations.

OR

16. Explain the different factors that affect the attenuation in transmission lines.
17. Give details of the different characteristics of end terminators to be considered when designing high frequency circuits.

OR

18. Explain the important electrical properties of connectors in high speed circuits.
19. Elaborate on the delay adjustments that are made in the clock distribution of high speed ICs.

OR

20. Write notes on the timing margins of high speed circuits. What are clock skew and clock jitter? How do they differ from each other? Explain.