APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

THIRD SEMESTER M. TECH DEGREE EXAMINATION

Electronics & Communication Engineering

(VLSI and Embedded Systems)

04EC7509—HIGH SPEED DIGITAL DESIGN

Max. Marks : 60 Duration: 3 Hours

PART A

Answer All Questions

Each question carries 3 marks

1. Differentiate between lumped and distributed system with an example.
2. An oscilloscope rated at 400 MHz was purchased and its probe was also rated at 300 MHz. Both specifications are in 3-dB bandwidths. How will this combination affect the rise time of the signal displayed when the input signal have 2-ns rise time?
3. Write a short note on EMI and crosstalk of point to point wiring.
4. Derive the characteristic equation and the characteristic impedance of an ideal transmission line at high speeds.
5. Comment on the inductance offered by vias.
6. Illustrate source termination.
7. Explain timing margin associated with clock distribution.
8. Write a short note on power rules.

PART B

Each question carries 6 marks

9. Illustrate four kinds of reactance associated with high speed digital circuits.

OR

10. What are the reasons for power dissipation in a digital circuit? Explain each type.

11. Explain the process involved in the estimation of self-inductance of probe ground loop and Q value of the probing circuit.

OR

12. Explain rise time and bandwidth of oscilloscope with necessary expressions and figures.

13. Discuss the problem of point to point wiring at high frequencies with necessary equations.

OR

14. Illustrate Timing Margin and its relation to Clock Skew.
15. Compare and contrast the features of low – loss and RC transmission line.

OR

16. Explain Proximity effect and Dielectric loss associated with high speed digital circuits.
17. Summarize end terminations in the following respects (a) Rise time by intuition and calculation (b) DC Biasing.

OR

18. Illustrate the capacitance associated with connectors.
19. With suitable diagrams, briefly discuss the design rules to be followed for providing stable voltage reference to the digital systems.

OR

20. Illustrate distributing uniform voltage to the digital systems?