



**B.E./B.Tech.(Full-Time) DEGREE EXAMINATION, APRIL/MAY 2011**

**ELECTRICAL AND ELECTRONICS ENGINEERING BRANCH**

**THIRD SEMESTER**

**EE273 — DIGITAL SYSTEMS DESIGN**

**(REGULATION 2004)**

**Time : Three hours**

**Maximum : 100 marks**

**Answer ALL questions.**

**PART A — (10 × 2 = 20 Mark)**

1. What is hamming code? How it is used?
2. What is meant by duality in Boolean algebra?
3. Why ECL logic is faster than TTL logic?
4. Design a full adder circuit using NAND gate only.
5. Write down the characteristics equation of SR flip flop.
6. What is meant by edge triggering?
7. What are the different modes of operation of asynchronous sequential circuits?
8. Compare synchronous and asynchronous circuits.
9. What is a ROM?
10. Why an EPROM is not a volatile memory?

**PART B — (5 × 16 = 80 Mark)**

11. (a) Find the minimal sum of products for the Boolean expression  $F = \sum(1,2,3,7,8,9,10,11,14,15)$  using the Tabular method. (16)
12. (a) i) Design a combinational circuit to convert BCD to Excess-3 code. (8)  
 ii) Explain with suitable circuit & truth table 1 to 8 Demultiplexer. (8)

(OR)

- (b) With a suitable diagram explain the working and characteristics of TTL logic. Also realize the logic gates AND, OR and NOR gates using TTL. (16)
  13. (a) (i) What are moore and mealy machine (4)  
 (ii) With relevant logic diagram explain the operation and features of master-slave JK flip flop (12)
- (OR)
- (b) Draw and explain the operation of up/down counter. (16)

14. (a) With suitable example explain the design procedure for fundamental mode operation of asynchronous sequential circuits. (16)

(OR)

(b) Design a Modulo – 8 binary counter. Assume a negative edge triggered flip-flop are used. Sketch the resulting output. (16)

15. (a) Write short notes on :

(i) PROM (8)

(ii) PLD (8)

(OR)

(b) With relevant block diagram explain in detail the principle of FPGA. (16)