

**D 4039**

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2007.

Third Semester

(Regulation 2004)

Electronics and Communication Engineering

EC 1201 — DIGITAL ELECTRONICS

(Common to B.E. (Part-Time) Second Semester Regulation-2005)

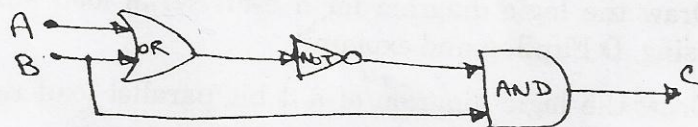
Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Convert binary number 11011110 into its decimal equivalent.
2. Mention any two applications of Demorgan's theorem.
3. What are the major categories of logic circuits?
4. Write the Boolean expression for the output of the system shown in figure below :



5. How does a JK flip flop differ from the SR flip flop in its basic operation?
6. Classify the registers with respect to serial and parallel input output.
7. What is race?
8. Define Static Memory.
9. Whether ROM is classified as a nonvolatile storage device? Why?
10. Write the advantage of EPROM over a PROM.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Convert the following decimal numbers to their hexadecimal equivalent : (8)

- (1)  $14_{10}$  (2)  $80_{10}$   
(3)  $3000_{10}$  (4)  $62.500_{10}$ .

- (ii) Explain the fundamental rules used in Boolean expression. (8)

Or

- (b) (i) Elaborate the basic laws of Boolean algebra with example. (6)

- (ii) Write the steps for simplifying a logic expression using a Karnaugh map. (10)

12. (a) (i) Explain the precautionary measures to be considered while handling CMOS device. (8)

- (ii) Draw the diagram and explain 1 to 16 Demultiplexer circuit. (8)

Or

- (b) (i) Simplify and draw the logic diagram for the expression shown below. (8)

$$Y = \bar{C} \cdot \bar{B} \cdot \bar{A} + \bar{C} \cdot B \cdot A + C \cdot \bar{B} \cdot A. \quad \text{EA}$$

- (ii) Analyse the performance characteristics of TTL and CMOS Logic. (8)

13. (a) (i) Draw the clocked RS Flipflop and explain with truth table. (8)

- (ii) Draw the four bit Johnson counter and explain the operation. (8)

Or

- (b) (i) Draw the logic diagram for a 5-bit serial load shift right register using D Flipflop and explain. (8)

- (ii) Draw the logic diagram of a 4 bit parallel load recirculating shift register and explain. (8)

14. (a) Draw the fundamental mode and pulse mode asynchronous circuit and explain in detail. (16)

Or

- (b) (i) Explain the following terms : (4 × 2 = 8)

- (1) Critical race (2) Non critical race  
(3) Hazard (4) Flow table.

- (ii) Illustrate the mixed operating mode sequential circuit model. (8)

15. (a) (i) Categorise RAM and ROM and explain in detail. (8)

(ii) Explain the following terms :

(1) Dynamic memory

(2) Volatile storage

(3) Field programmable

(4) Mask programmable. (8)

Or

(b) Explain the basic structure of  $256 \times 4$  static RAM with neat sketch. (16)