

OCTOBER 2011

**P/ID 17454/RCD/
PCAG**

Time : Three hours

Maximum : 75 marks

PART A — (5 × 5 = 25 marks)

Answer ALL questions.

1. (a) Implement the given Boolean function $F = xy + x'y' + y'z$ with only AND and NOT gates.

Or

- (b) Simplify the Boolean function

$$F = A'C + A'B + AB'C + BC \text{ using k-map.}$$

2. (a) Design a Full-Subtractor circuit.

Or

- (b) Write short note on decoders.

3. (a) Design a D-Flip-Flop.

Or

- (b) Design a Serial Shift Register.

4. (a) Design and discuss about status Register.

Or

- (b) Design a simple logic circuit that performs basic operations.

5. (a) List and discuss about the registers for computers.

Or

- (b) Draw the block diagram of control logic and discuss.

PART B – (5 × 10 = 50 marks)

Answer any FIVE questions.

6. (a) Express the function $F(x,y,z)=1$ in a sum of minterms and product of maxterms.
- (b) State and prove De-morgan's law.
7. Determine the prime implicants of the function $F = \Sigma(1,4,6,7,8,9,10,11,15)$
8. Implement $F(A,B,C,D) = \Sigma(0,1,3,4,8,9,15)$ with a multiplexer.

9. (a) Implement the full adder circuit (6)
(b) Write short notes on multilevel NAND circuits. (4)
 10. Design a clocked master slave JK Flip-Flop.
 11. Design a 3-bit binary counter.
 12. Draw the block diagram of a processor unit and explain.
 13. Briefly discuss about the PLA control for computer.
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