

**5213/A13**

**MAY 2011**

**DIGITAL PRINCIPLES AND APPLICATIONS**

---

Time : Three hours                      Maximum : 100 marks

PART A — (6 × 5 = 30 marks)

Answer any SIX questions.

1. Convert (534) to binary number.
2. Explain the EXCESS code.
3. Explain the AND gate and Truth Table.
4. Prove that  $(A + B) \cdot (A + C) = A + B \cdot C$ .
5. Write a note on product of sums.
6. Explain the Decoder.
7. Explain the full adder circuit and truth table.
8. Draw the circuit JK flipflop and explain its working.

9. Binary addition following number :

- (a) 15 + 18
- (b) 9 + 16.

10. Explain the Distributive law.

PART B — (4 × 10 = 40 marks)

Answer any FOUR questions.

- 11. (a) Explain the Commutative law.
- (b) Explain the Associated law.

12. Briefly discuss the Duality theorem.

13. Simplify  $Y = \bar{A} \bar{B} \bar{C} + \bar{A} \bar{B} \bar{C} + \bar{A} \bar{B} \bar{C} + \bar{A} \bar{B} \bar{C}$ .

14. Explain the astable multivibrator.

15. Describe with a logic diagram parallel in parallel out shift. Register.

16. Explain the Mod 5 counter.

PART C — (2 × 15 = 30 marks)

Answer any TWO questions.

17. Explain the serial-in and serial-out shift register with wave form.

18. (a)  $AB + \bar{A}\bar{C} + \bar{A}BC(AB + C) = 1$

(b)  $\bar{A}\bar{B}(A + C) + AC(\bar{A} + \bar{B}) = 1$

19. Simplify the equation using K-map.

$F(A, B, C, D) = (0, 1, 2, 3, 4, 5, 6, 7)$ .