

- b) Explain in detail the 3 bit counter using T Flip Flop with its state diagram, excitation table, K-map, logic diagram. *13,K2,CO3*
14. a) Explain the steps for the design of asynchronous sequential circuits with an example. *13,K2,CO4*
- OR**
- b) Illustrate about hazards in sequential circuits and the steps to avoid hazards in it. *13,K2,CO4*
15. a) Implement a full adder circuit using PLA having three inputs, eight product terms, and two outputs. *13,K2,CO5*
- OR**
- b) Design a PLA structure using AND and OR logic for the following functions. $F1 = \sum_m(0, 1, 2, 3, 4, 7, 8, 11, 12, 15)$ $F2 = \sum_m(2, 3, 6, 7, 8, 9, 12, 13)$ $F3 = \sum_m(1, 3, 7, 8, 11, 12, 15)$ $F4 = \sum_m(0, 1, 4, 8, 11, 12, 15)$. *13,K3,CO5*

PART - C (1 × 15 = 15 Marks)

16. a) Design a combinational circuit with three inputs, x, y and z, and the three outputs, A, B, and C. when the binary input is 0, 1, 2, or 3, the binary output is one greater than the input. When the binary input is 4, 5, 6, or 7, the binary output is one less than the input. *15,K3,CO3*
- OR**
- b) Apply K-map and simplify the following. $Y = C' (A'B'D' + D) + AB'C + D'$. *15,K3,CO3*