

PART D*Answer any two full questions, each carries 9 marks.*

- 12 a) Design a 4-bit Binary to Gray code converter. (7)
 b) Implement the logic function $F = A \oplus B \oplus C$ using a 8:1 multiplexer. (2)
- 13 a) Explain race around condition in JK flip-flop. Explain how a master slave flip-flop avoids race around condition. (6)
 b) Convert JK Flip-Flop to T Flip-Flop. (3)
- 14 a) Design and implement full subtractor by using only NAND gates. (5)
 b) Explain 2 bit magnitude comparator using logic diagram. (4)

PART E*Answer any four full questions, each carries 10 marks.*

- 15 Design a synchronous counter using JK flip-flop which counts through the states 0,1,3,4,5,6,0..... Is the counter self starting? (10)
- 16 Draw and explain 4 bit Johnson counter. Also draw its timing sequence. (10)
- 17 a) Draw and explain the different types of shift registers. (8)
 b) List down the applications of shift registers. (2)
- 18 a) Write short notes on PLA. (3)
 b) Give any 2 applications of ROM. (3)
 c) Compare Static RAM and Dynamic RAM. (4)
- 19 Find the minimum size of PLA required to implement the following functions? (10)
 Hence implement the following function using PLA.

$$F_1(A, B, C) = \sum m(0,2,4,7) \quad F_2(A, B, C) = \sum m(3,5,6,7)$$
- 20 Explain the algorithm for floating point addition and subtraction. (10)
