



- Notes :
1. All questions are compulsory and carry equal marks.
 2. Draw neat and labelled diagrams wherever necessary.
 3. Use of log table calculator is allowed.

- 1. EITHER**
- a) Explain 2,3 and 4 variable K-map with example of each. **5+5**
 Draw and Simplify.
 K-map for:-

$$F(A,B,C,D) = \sum m(1,3,5,7,8,9,10,11)$$
- OR**
- b) What is multiplexer? Explain the concept of N:1 multiplexer. **4+6**
 Draw logic diagram of 4:1 MUX and explain its working.
- 2. EITHER**
- a) What is decoder? Draw logic diagram of 1 of 10 decoder and give its truth table. **5+5**
 Explain with suitable diagram BCD to 7-segment decoder/ Driver.
- OR**
- b) Draw a diagram of Decimal to BCD encoder and explain its working. **5+5**
 What is full adder? Give truth table, logic diagram and Boolean equation of full adder.
- 3. EITHER**
- a) Draw a logic diagram of clocked RS flipflop and explain its working state its drawbacks. **5+5**
 How are these drawbacks eliminated in D-flipflop? Explain.
- OR**
- b) Draw and explain construction and working JK flipflop. **10**
 What is race around condition? Explain.
- 4. EITHER**
- a) Draw a block diagram of 4-bit ripple counter and explain its working. **8+2**
 Give its truth table and timing diagrams differentiate between synchronous and asynchronous counter.
- OR**
- b) What is modulus of counter? Explain with example. **3+7**
 Draw a block diagram of decade counter and explain its construction and working.
- 5.**
- a) What is Demultiplexer? Explain the concept of 1:N Demultiplexer. **10**
 b) Explain the working of 2's complement adder/ subtractor.
 c) What is TFF? Explain its working.
 d) Explain the working of 3-bit ring counter.
