

THIRD SEMESTER B.TECH. (INSTRUMENTATION AND CONTROL ENGG.) END SEMESTER EXAMINATIONS, DEC - 2017

SUBJECT: DIGITAL ELECTRONIC CIRCUTS [ICE 2103]

Duration: 3 Hour

Max. Marks:50

3

4

Instructions to Candidates:

- Answer ALL the questions.
- Missing data may be suitably assumed.

1A Perform the following conversions:

(i)
$$(1001)_{BCD} = (?)_{Excess-3 \text{ Code}}$$
 (ii) $(0110)_2 = (?)_{Grav-code}$ 2

1B Realize the circuit shown in FIG Q.1B, using only 2 input NOR gates.

f

1C Minimize the following expression using tabular method.

$$f = \prod(1,3,5,10,12,14)$$

- 2A Design a circuit to enable an additive to be introduced through another inlet into syrup if and only if the temperature of the syrup is at a specified value and also the syrup level is at a lowlevel sensor.
- **2B** Design a logic circuit that converts a 3 bit Binary data to its equivalent Gray code.
- **2C** Implement the following Boolean function using 8:1 MUX.

$$f = \sum m(1,3,4,11,12,13,14,15)$$

3 A	Illustrate the need for Master-Slave configuration for JK flip-flops.	2
3B	Convert T flip-flop into JK flip-flop.	3
3 C	Design divide by 6 counter using T flip-flop and draw the logic diagram.	5
4 A	Write a short note on pseudo-random binary sequence generator.	3
4B	Explain the working of Johnson counter with a neat circuit diagram and waveforms.	4
4C	With the help of shift registers design a 4-bit serial adder and explain.	3
5A	Draw and explain the block diagram of Moore model.	2

- **5B** Design Excess-3 to BCD code converter and implement using PLA.
- **5C** Briefly explain different methods with examples required to analyze the clocked synchronous 4 sequential networks.



FIG Q.1B
