Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

A Constituent Institution of Manipal University

SIXTH SEMESTER B.TECH. (INSTRUMENTATION & CONTROL ENGG.)

END SEMESTER EXAMINATIONS, JUNE 2017

SUBJECT: EMBEDDED SYSTEM DESIGN [ICE 4002]

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer **ALL** questions.
- Draw diagram wherever required

1A.	List and define the three main IC technologies. What are the benefits of using these technologies in designing?	**3**
1B.	List and define the three main processor technologies. What are the benefits of using these processor technologies?	**3**
1C.	Describe what is meant by edge-triggered and explain why it is used.	**2**
1D.	What is a design metric?	**2**
2A.	How a memory location is identified by the processor inside DRAM, brief about different timing parameters involved in it	**4**
2B.	With help of an FSK diagram explain how ROM wait stage work.	**4**
2C.	Explain why NAND and NOR gates are more common than AND and OR gates.	**2**
3A.	Illustrate how communication & synchronization is done among processes control devices.	**5**
3B.	A subway has an embedded system controlling the toll gate, which releases when two tokens are deposited. (a) Draw the FSMD state diagram for this system. (b) Separate the FSMD into an FSM+D.	**5**
4A.	List and describe the components of an embedded system based closed-loop control. Give a real-life example.	**6**
4B.	Write a generic PID controller in C. (with comments)	**4**
5A.	Briefly describe the computation models commonly used to describe embedded systems and/or their peripherals. For each model list two languages that can be used to capture it.	**5**
5B.	List three requirements of real-time systems and briefly describe each. Give examples of actual real-time systems to support your arguments.	**5**