

(A constituent unit of MAHE, Manipal)

SIXTH SEMESTER B.TECH. (INSTRUMENTATION AND CONTROL ENGG.) END SEMESTER DEGREE EXAMINATION, JUNE - 2019

SUBJECT: EMBEDDED SYSTEM DESIGN [ICE 4002]

TIME: 3 HOURS

MAX. MARKS: 50

Instructions to candidates : Answer ALL questions and missing data may be suitably assumed.

- 1A Using revenue model, derive the percentage revenue loss equation for any rise angle, rather than for 45 degrees.
- 1B Explain any two processor technologies.
- 1C Design a single purpose processor that outputs gcd of two numbers. Start with a function computing the desired result, obtain the state diagram and sketch a probable datapath.

(3+3+4)

- 2A What is a single purpose processor? What are the benefits of choosing a single purpose processor over a general purpose processor?
- 2B Build a 3 input NAND gate and 2 input OR gate using minimum number of CMOS transistors.
- 2C Design a sequential logic design to construct a pulse divider. Also modify the same design to slow down the pre-existing pulse so that the output is 1 for every four pulses detected.

(3+3+4)

- 3A Intel PIII processor executes 900 MIPS and TI C5416 processor executes 600 MIPS. What is the speed of the two processors in terms of Dhrystones per second? Also compare the performance of the processors in terms of speed.
- 3B Describe the tools used in testing and debugging of embedded systems.
- 3C Explain the addressing mechanism for memory read operation in basic DRAM architecture with block diagram

(2+4+4)

(2+4+4)

- 4A Sketch the internal design of a 4 X 3 ROM.
- 4B Explain shared memory and message passing with example.
- 4C Differentiate between state machine model and sequential program model with examples.
- 5A What are the different parts in designing an automobile cruise controller? Explain.
- 5B Describe the performance parameters for evaluating control system design objectives.

(5+5)
