Roll No. | | | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 08

M.Tech.(Emb Sys) (2016 & Onwards) (Sem.–2)

EMBEDDED SYSTEM DESIGN

Subject Code : MTED-201

Paper ID : [74268]

Time : 3 Hrs. Max. Marks : 100

INSTRUCTIONS TO CANDIDATES :

1. **Attempt any FIVE questions out of EIGHT questions.**
2. **Each question carries TWENTY marks.**

1. a. What is an embedded system? Explain. List and define the three main characteristics of embedded systems that distinguish such systems from other computing systems.

   b. List and define the three main IC technologies. What are the benefits of using each of the three different IC technologies? Explain.

2. a. What is a single-purpose processor? What are the benefits of choosing a single-purpose processor over a general-purpose processor? Explain in detail.

   b. Acquire a databook for a microcontroller. List the features of the basic version of that microcontroller, including key characteristics of the instruction set (number of instructions of each type, length per instruction etc.), memory architecture and available memory, general-purpose registers, special-function registers, I/O facilities, interrupt facilities, and other salient features.

3. a. Briefly describe each of the following : mask-programmed ROM, PROM, EPROM, flash EEPROM.

   b. Sketch the internal design of a 4×3 RAM.

4. Given a 100MHz crystal-controlled oscillator and a 32-bit and any number of 16-bit terminal-count timers, design a real-time clock that outputs the date and time down to milliseconds. You can ignore leap years. Draw a diagram and indicate terminal-count values for all timers.

5. Explain in detail about embedded system development process.

6. a. Explain embedded operating systems. Also list and explain types of embedded operating systems.

   b. Differentiate between assembly language and high level language with the help of an example to each.

7. List and explain the challenges and issues in embedded software development.

8. Explain the following :

   a. Buffers and latches

   b. UART

   c. Crystal

   d. Timers and counters.