T.E / SEM V / CBGS / IT / MES

29/5/17

Q.P. Code : 594401

(3 Hours) **[Total Marks: 80**

N.B.:- (1) Question No. **1** is **Compulsory**.
(2) Solve any **three** questions from the remaining **five** questions.
(3) **Figures** to the **right** indicate **full** marks.
(4) Make **suitable** assumptions wherever **necessary** and state them **clearly**.

1. (a) Define Embedded System. Explain classification of embedded system. **5**
   (b) State the features of 8051 microcontroller. **5**
   (c) Explain Semaphores and Mutex in RTOS. **5**
   (d) Explain pipelining in ARM processor. **5**

2. (a) Explain the Embedded System architecture in detail. **10**
   (b) Explain the Timer/ Counter of IC 8051. **10**

3. (a) Write an assembly language program for 8051 microcontroller to generate a square wave of 2KHz on pin 1.0 assuming crystal frequency of 12 MHz. Justify the mode of operation. **10**
   (b) Explain the hardware and software interrupts of 8051 microcontroller. **10**

4. (a) Explain the addressing modes of ARM 7 Processor **10**
   (b) Explain the following instructions with suitable examples w.r.t ARM processor **10**
   (i) BLX
   (ii) CMN
   (iii) SWP
   (iv) MVN
   (v) LDC

5. (a) Explain the various methods to implement interprocess communication. **10**
   (b) Explain the addressing modes of 8051 microcontroller. **10**

6. Write note on (**any two**): **20**
   (a) Battery operated smart card reader
   (b) Digital clock as an Embedded system
   (c) Serial communication of 8051
   (d) Assembler directives