

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. Discuss various components of embedded system. 5
(b) What is Semaphore? Explain Mutex in RTOS. 5
(c) Compare AJMP, SJMP, LJMP instructions of 8051. 5
(d) Explain the brief Real Time operating Systems 5
2. (a) Explain in detail ARM 7 pipelining 10
(b) Explain the Timer/ Counter of IC 8051. 10
3. (a) Write an assembly language program for 8051 microcontroller to multiply two 8 bit numbers stored external memory locations 4000H and 4001 H. Send the result on PORT 1 and PORT 3. 10
(b) Explain CPSR register of ARM 7 processor. 10
4. (a) Explain the addressing modes of ARM 7 processor. 10
(b) Explain the hardware and software interrupts of 8051 microcontroller 10
5. (a) Explain Internal memory organization of 8051. 10
(b) Explain the addressing modes of 8051 microcontroller. 10
6. Write note on (**any two**): 20
(a) Automated meter reading system.
(b) Digital Camera.
(c) Serial communication of 8051.
(d) Assembler directives.