

N.B. : (1) Question No. 1 is compulsory.

(2) Solve any **three** questions out of remaining **five** questions.

(3) **Assume** suitable data if **necessary**.

(4) **Draw** neat diagrams wherever **necessary**.

1. (a) Define and classify the embedded systems, give few examples of such systems. 5
 (b) Compare AJMP, SJMP, LJMP instructions of 8051. 5
 (c) Explain function of \overline{PSEN} and \overline{EA} pins of 8051. 4
 (d) Describe the principal features of the ARM architecture. 6
2. (a) Explain Internal memory organization of 8051. 10
 (b) Explain addressing modes of ARM 7 processor. 10
3. (a) Explain interrupt structure of 8051 in detail. 10
 (b) What is semaphore? Explain the use of semaphore with respect to embedded operating systems. 10
4. (a) Write assembly language program for 8051 to multiply two 8 bit numbers stored in external memory locations 4000 H and 4001 H. Send the result on PORT 1 and PORT 3. 10
 (b) Explain CPSR of ARM 7 processor. 10
5. (a) What do you mean by Task and Task state related to embedded operating systems and also discuss about task control block (TCB) and its data. 10
 (b) Write assembly language program for 8051 to transfer message "ENGINEER" serially at the baud rate of 4800 in mode 1. 10
6. (a) Explain Smart Card Reader system in detail. 12
 (b) Explain priority inversion problem in Embedded System. How does it is resolved? 8