| | **(3 hours)** | **Total Marks: 80** |

N.B:
(1) Question No. 1 is compulsory.
(2) Solve any three questions from remaining five questions.
(3) Draw neat diagrams and assume suitable data wherever necessary. Justify your assumptions.

1. Attempt any **four**: **20**
  (a) Differentiate between RISC and CISC processors.
  (b) List the features of MSP430.
  (c) Explain MACROS in embedded systems with its syntax.
  (d) Draw & Explain CPSR of ARM7.
  (e) Explain ALE/PROG, EA/VPP, PSEN pins of 8051

2. **(a)** Explain SFR's related to serial data I/O (SCON) with its mode of operation. **10**
  (b) Describe pipes, mail boxes & Message queues in RTOS. **10**

3. **(a)** Write a program in 8051 to sort the array of 10 numbers into positive & negative numbers. Store count of positive number in R0 & negative numbers in R1. **10**
  (b) Explain the processor operating modes of ARM7. **10**

4. **(a)** Draw & explain the interfacing of 8051 with DC motor. Also write a program in assembly to rotate DC motor continuously in clockwise direction. **10**
  (b) What is priority inversion; Explain with one suitable example& suggest any two remedies for the same. **06**
  (c) List and explain long multiply instructions of arm7. **04**

5. **(a)** Write short note on Barrel shifter. **04**
  (b) What are addressing modes of 8051, explain with one example each. **10**
  (c) Write a program in 8051 assembly language to find factorial of a number. **06**

6. **(a)** Describe the concepts Assembler, Compiler, Linker & Loader in embedded c. **08**
  (b) List & explain the different addressing modes of MSP430. **06**
  (c) What is the role of Scheduler in RTOS? Explain different scheduling algorithms **06**

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