

(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) Draw the block diagram of microcontroller and microprocessor.
 - (b) Draw the format for interrupt enable register with function of each bit.
 - (c) List the features of ARM7 microcontroller.
 - (d) Describe the register bank of 8051 microcontroller.
 - (e) Describe the addressing modes of ARM7 microcontroller with example.

2.
 - (a) Draw and describe the architecture of 8051 microcontroller. 8
 - (b) Describe the techniques used for memory optimization. 6
 - (c) Draw the format for status register of MSP430 also write the function of each bit. 6

3.
 - (a) Draw the interfacing of 8051 microcontroller with seven segment LED. Also write an assembly language program to display 0 to 8 digits. 8
 - (b) Draw the RTOS kernel with common components also describe them. 6
 - (c) Describe the functions in Embedded C-programming. 6

4.
 - (a) With diagram describe the hardware/software co-design. 5
 - (b) Describe the instruction set of ARM7 with example. 5
 - (c) Describe the function of assemblers, loaders and linkers. 5
 - (d) Describe the big endian and little endian format of ARM7 microcontroller. 5

5.
 - (a) Draw the interfacing of ARM7 with stepper motor. Also write a program to rotate it in anti-clock wise direction. 8
 - (b) With neat diagram describe the counting and mutex semaphore. 6
 - (c) Describe the different addressing modes of MSP430 with example. 6

6.
 - (a) Draw the format for CPSR register. Also describe the function of each bit. 8
 - (b) Draw and describe the architecture of MSP430. 6
 - (c) Describe the priority preemptive scheduling algorithm with example. 6