

(3 Hours)

[Total Marks : 100

- N.B.** (1) Questions No. 1 is **compulsory**.
 (2) Attempt any **four** questions of remaining **six** questions.
 (3) Draw **neat** diagrams and assume **suitable** data wherever **necessary**.

1. (a) Explain power-saving modes of 8051. 20
 (b) Explain TCON & TMOD registers of 8051.
 (c) Explain different hardware components of an embedded system.
 (d) Explain banking structure of 8051. Comment about stack of 8051.
2. (a) Explain with neat block-diagram the architecture of 8051. What are SFRs ? 10
 Comment on bit-addressable memory.
 (b) Write an assembly language program to transfer 10-bytes. 10
 (i) Internal RAM to Internal RAM
 (ii) External RAM to Internal RAM.
3. (a) Explain different modes of 8051 to be used as timer and counter. Draw relevant control-registers. 10
 (b) Write a program in assembly language to generate a square-wave with 50% duty-cycle of 2kHz on Port 3 bit 1. Assume X-tal as 12MHz. 10
4. (a) Design 8051 based system : 10
 (i) 16 KB program memory
 (ii) 64 kB data memory
 (iii) Two ports, one input and one output port out of which configure any one port in hardshaking mode.
 (b) Explain different addressing modes of 8051. Give example of each mode with proper explanation. 10
5. (a) Define the term "Embedded System." Explain the methods by which the software can be embedded into an embedded system. 10
 (b) Explain the "Structural Units of a Processor" with neat block-diagram. 10
6. (a) Differentiate between serial and parallel communication. Explain Asynchronous serial communication with 8051. 10
 (b) Write a program to transfer message "YES" serially at 9600 baud, 8-bit data, 1-stop bit. Do this continuously. 10
7. Write short notes on :— 20
 (a) Device-drivers
 (b) Interrupt latency
 (c) PCI and PCI-X bus
 (d) I2C and CAN bus.