

# 22537

**22223**

**3 Hours / 70 Marks**

Seat No.

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- Instructions* – (1) All Questions are *Compulsory*.  
(2) Answer each next main Question on a new page.  
(3) Illustrate your answers with neat sketches wherever necessary.  
(4) Assume suitable data, if necessary.  
(5) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

**Marks**

- 1. Attempt any FIVE of the following: 10**
- State the need of power saving options in 8051 microcontroller.
  - Define the term microcontroller and Bus also list types of buses in  $\mu\text{c}$ .
  - Write a single instruction for the following operations:
    - Jump to relative address if bit P1.3 is '0'
    - To copy the content of R<sub>0</sub> to Accumulator.
  - Draw format for IE and IP special function register.
  - Compare data and program memory on the basis of any four points.
  - List the functions of following pins in interfacing of  $16 \times 2$  LCD to 8051  $\mu\text{c}$ .
    - R<sub>S</sub>
    - R/W
    - EN
    - D<sub>0</sub> to D<sub>7</sub>
  - List the applications of stepper motor. any four.

P.T.O.

- 2. Attempt any THREE of the following:** **12**
- a) Compare Harvard and Von-Newman architecture on basis of any four points.
  - b) Define - Editor, Compiler, Cross-Compiler and assembler.
  - c) Interface ADC0809 with 8051 write a program to read from the device and convert to digital data.
  - d) Draw TMOD and TCON Special function Registers and write function of each bit of this SFR's.
- 3. Attempt any THREE of the following:** **12**
- a) Draw and explain the architecture of 8051 microcontroller.
  - b) Write ALP to transfer five data bytes from one location to another.
  - c) Draw interfacing of stepper motor with 8051 and axle ALP to rotate in clockwise direction.
  - d) Write the addressing modes of following instructions:
    - i) XCH A, @RO
    - ii) DJNZ, R3, UP
    - iii) CPL, P1.1
    - iv) MOVX A, @DPTR.
- 4. Attempt any THREE of the following:** **12**
- a) State the alternate functions of part 3 pins.
  - b) Define the mode of communication used in 8051  $\mu$ c and write format of SCON and PCON SFR's.
  - c) Draw interfacing diagram and memory map of 4KB ROM and 8 KB RAM to 8051.
  - d) Write ALP for generation of square waveform using DAC.
  - e) Write ALP for temperature controller using ADC (0808109).

- 5. Attempt any TWO of the following:** **12**
- a) Draw Pin diagram of 8051 and explain the functions of each pin.
  - b) Explain any size addressing modes of 8051  $\mu$ c with example.
  - c) Draw interfacing of  $16 \times 2$  LCD to 8051 write ALP to display pressed key.
- 6. Attempt any TWO of the following:** **12**
- a) Sketch priority level structure of 8051 and write ALP for indication of interrupt  $\overline{\text{INT0}}$  on any port pin.
  - b) Write all arithmetic instructions of 8051 and write ALP for addition of two 16 bit numbers store in external memory.
  - c) Write a ALP for traffic light controller.
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