

314328

12526

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) Figures to the right indicate full marks.
- (5) Assume suitable data, if necessary.
- (6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

- 1. Attempt any FIVE of the following :** **10**
- a) List any four selection criteria for microcontroller.
- b) Find out the number of address lines required to access 4 KB of ROM
- c) Identify the tool required to :
- i) Convert High level program to machine language.
- ii) De Fragmenting [combining] various parts of program together.
- d) Give the need of stepper motor driver IC in steppermotor interfacing.
- e) State the need of the GATE bit in TMOD SFR of 8051.
- f) List the hand shaking signals used for ADC interfacing with 8051 microcontroller.
- g) List the SFR's used while generating square wave.

P.T.O.

2. Attempt any THREE of the following : 12

- a) Explain any four addressing modes with one example of each, in brief.
- b) Describe the functions of following pins:
 - i) RST
 - ii) $\overline{\text{PSEN}}$
 - iii) ALE
 - iv) $\overline{\text{EA}}$
- c) Draw interfacing diagram of 16×2 LCD with 8051 and state the function of EN and RS pin of LCD.
- d) Develop an ALP to rotate stepper motor continuously in clockwise direction. (Assume step angle 1.8°)

3. Attempt any THREE of the following : 12

- a) Draw and explain format of TCON SFR.
- b) Design a microcontroller based system having 16 Kbytes ROM and 32 Kbytes of RAM.
- c) Draw the architecture of 8051.
- d) Explain the following instructions –
 - i) DJNZ 60H, UP
 - ii) ANLA, # 35H
 - iii) SWAPA
 - iv) MUL AB

- 4. Attempt any THREE of the following :** **12**
- a) Compare Harvard and Von-Neumann architecture. (Any four points)
 - b) Develop an ALP to transfer the given block of 10 numbers from source to destination. Assume internal RAM address.
 - c) Develop an ALP to toggle the LED after every 500 msec connected to pin P2.0 and P2.1 after the occurrence of INTI.
 - d) Develop square wave with equal on and off time on pin P3.0. Assume crystal frequency of 11.0592 MHz.
 - e) List machine control instructions and explain them.
- 5. Attempt any TWO of the following :** **12**
- a) Explain the two power saving options of 8051 microcontroller in brief.
 - b) Develop an ALP to transmit “MSBTE” serially at 9600 baud rate. Assume 12 MHz crystal frequency.
 - c) Draw interfacing of 7 segment display with 8051 microcontroller write ALP to display count from 0 to 9.
- 6. Attempt any TWO of the following :** **12**
- a) Draw interfacing of ADC with 8051 microcontroller and write program for analog – digital conversion.
 - b) Develop an ALP to read temperature from LM 35 sensor. Draw interfacing diagram with 8051.
 - c) State various modes of serial communication in 8051. Explain any one in brief.
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