

22426

12223

3 Hours / 70 Marks

Seat No.

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- Instructions* –
- (1) All Questions are *Compulsory*.
 - (2) Illustrate your answer with neat sketches wherever necessary.
 - (3) Figures to the right indicate full marks.
 - (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

- a) Define the term BUS. List out the different types of buses.
- b) Sketch figure for interfacing microcontroller 8051 with two LEDs.
- c) List two instructions of microcontroller which are used to transfer data from external memory.
- d) State all the bits of TMOD SFR.
- e) Compare microprocessor and microcontroller.
- f) Compare program memory and data memory.
- g) Give different applications of stepper motor.

P.T.O.



2. Attempt any THREE of the following:

- a) Describe water level controller with suitable sketch.
- b) Explain internal memory organization of RAM for microcontroller 8051.
- c) State alternative functions of port-3 of 8051 microcontroller.
- d) Sketch interfacing diagram of 4K byte EPROM and 4K byte of RAM to 8051.

3. Attempt any THREE of the following:

12

- a) Differentiate between Harvard and Von-Neuman architecture.
- b) Develop an ALP of transfer block of ten bytes from external RAM memory location 7000H to internal RAM 50h onwards.
- c) Explain four addressing modes of 8051 microcontroller with suitable example.
- d) Explain interrupt structure of 8051.

4. Attempt any THREE of the following:

12

- a) Develop an ALP to read temperature from LM 35 sensor. Draw the interfacing diagram with 8051.
- b) What is the need of power down mode? Is it available in 8051 microcontroller or any other controller of MCS-51 family? Draw format of PCON SFR.
- c) Interface ADC 0809 with 8051 and write a program to read data from the device and convert to digital data.
- d) Describe traffic light controller with suitable interfacing diagram.
- e) Select suitable SFR to provide following settings in microcontroller
 - i) Select register bank-2
 - ii) Select power down mode for power saving.

5. Attempt any TWO of the following:

- a) Sketch pin configuration of microcontroller 8051. Describe following pins :-
- i) \overline{EA}
 - ii) ALE
 - iii) \overline{PSEN}
- b) Develop an ALP for adding series of ten numbers stored at 7000H memory onwards. Store the result at 7020H memory location.
- c) Sketch and explain 8051 interfacing with DAC and develop a program for generation of triangular waveform.

6. Attempt any TWO of the following:

- a) Develop an ALP to rotate a stepper motor in clock-wise direction connected at lower port pins of port-1. Explain with suitable interfacing diagram.
- b) Develop an ALP to transfer data "WELCOME" serially with baud rate 9600. Describe use of SMOD bit for serial communication. Assume $f_{osc} = 11.0592 \text{ MHz}$.
- c) State and explain following software development tools.
- i) Editor
 - ii) Assembler
 - iii) Compiler
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