22537

21222

3 Hours / 70 Marks Seat No. | | | | | | | | |

15 minutes extra for each hour

Instructions – (1) All Questions are *Compulsory.*

(2) Illustrate your answers 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) State two merits of micro controller over microprocessor.

b) Sketch interfacing diagram 2K byte EPROM to 8051 micro controller.

c) State the function of any two assemble directives.

d) List two top priority interrupts with their vector addresses.

e) State one application under Von-Neuman and Harvard architecture.

f) Draw the interfacing diagram of relay with 8051 micro controller.

g) Write an assembly language program to generate triangular wave using DAC.

Marks

2. Attempt any THREE of the following: **12**

a) Draw the interfacing diagram of stepper motor with 8051 microcontroller. Write an ALP to rotate it in anti clockwise direction.

b) Compare 8051 and 8751 (four points).

c) Draw the format of SCON register of 8051 and explain the function of each bit.

d) Draw the interfacing diagram of seven segment display to 8051 micro controller. Write an assembly language program to display 'g' on 7 segment display.

3. Attempt any THREE of the following: **12**

a) Describe the power saving modes of 8051 micro controller.

b) With the help of ADD instruction explain

i) Direct addressing mode

ii) Indirect addressing mode

iii) Immediate addressing mode

iv) Register addressing mode

c) State the roll of assembler, editor, linker and compiler in software development cycle.

d) Write an assembly language program to generate a 1 KHz square wave on port pin P1.5 using mode 1 of timer 0. Asuume crystal frequency 11.0592 MHz.

4. Attempt any THREE of the following: **12**

a) Develop an 8051 based system for water level controller. Draw the interfacing diagram and write ALP for the same.

b) Describe the function of the following pins of 8051 microcontroller.

i) $\overline{\text{PSEN}}$

ii) $\overline{\text{EA}}$

iii) ALE

iv) RST

Marks

c) Draw the interfacing diagram of LM35 temperature sensor with 8051 and write an ALP to read temperature.

d) Interface ADC 0809 with 8051 and write a program to read data from the device and convert to digital data.

e) Develop an ALP to receive 10 bytes of data serially at baud rate 4800 and save them in accumulator.

5. Attempt any TWO of the following: **12**

a) Sketch memory organization of 8051 and label it showing register banks, bit addressable locations, SFR external data and code memory.

b) Write an ALP to find sum of data stored in five consecutive memory location starting from 40H. Store the carry and sum at 63H and 64H.

c) Draw the interfacing diagram of 4 × 4 keyboard matrix with 8051 microcontroller to port 1 and port 2. Draw a flow chart to detect a pressed key.

6. Attempt any TWO of the following: **12**

a) Develop an 8051 traffic light controlling. Draw interfacing diagram and write an ALP for the same.

b) Write a program (ALP) to toggle the port 1 pin P1.1 after receiving external interrupt INT1.

c) Describe the function of the following instructions.

i) MOV A, @ A + DPTR

ii) XCHD A, @ R ;

iii) SWAP A

iv) DA A

v) ORL A, @R_i

vi) INC R_o

vii) SJMP rel