17658

11819

3 Hours / 100 Marks Seat No. | | | | | | | | |

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. a) **Attempt any THREE of the following:** **12**

(i) What is multi core processor? Describe in brief.

(ii) State any four features of IDE.

(iii) State four features of Zigbee.

(iv) Draw the labelled interfacing diagram to interface relay with 89C51 microcontroller.

b) **Attempt any ONE of the following:** **6**

(i) Draw the block diagram of an embedded system and describe the hardware units of an embedded system.

(ii) State the methods of task synchronization. Describe semaphore with suitable example.

Marks

2. Attempt any FOUR of the following: **16**

a) Compare Harvard and Von Neuman architecture with a suitable diagram.

b) State any four 'C' data types with their value range.

c) What are the features of IEEE 802.11 wireless LAN protocol?

d) Write a program in 'C' language for generating triangular waveform using DAC 0808.

e) State any four key specifications of RTOS.

f) Give classification of embedded systems. Explain any one.

3. Attempt any FOUR of the following: **16**

a) Write 89C51 program in 'C' language to toggle bits of port P1 continuously.

b) Compare CAN and I2C protocols with respect to :

(i) Data transfer rate

(ii) Number of fields

(iii) Addressing bit and

(iv) Application

c) What is interrupt and event handling in RTOS? Explain in brief.

d) Give advantages and disadvantages of embedded systems.

e) Write 89C51 'C' program to rotate stepper motor by 90° in clockwise direction. Motor has step angle of 1.8°.

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

(i) Draw the format of SCON. Describe the function of each bit.

(ii) Compare serial and parallel communication (any four points)

(iii) Describe any four design metrics of an embedded system.

(iv) Compare RTOS with desktop operating system (any four points)

Marks

b) **Attempt any ONE of the following:** **6**

(i) Write 'C' program to generate frequency of 2.5 KHz on P2.7. Use timer 1 in mode 2 to generate the delay. (f_{osc} = 12 mHz)

(ii) Draw the lablelled diagram of LCD interface with 89C51. Write a program in 'C' language to display ''WELCOME'' on LCD.

5. Attempt any FOUR of the following: **16**

a) Write 89C51 'C' program to transfer character 'MSBTE' serially at 9600 baud rate continuously, use 8 bit data and 1 stop bit. Assume crystal frequency of 11.0592 MHz.

b) Describe the need of RS-232 and MAX - 232 with a suitable diagram.

c) Draw labelled interfacing diagram of ADC 0808 with 89C51 microcontroller.

d) Describe round robin scheduling algorithm with suitable example.

e) List the software development tools used in an embedded system and state the functions of any two.

f) Draw and explain the interfacing of DC motor with 89C51 microcontroller.

6. Attempt any FOUR of the following: **16**

a) What is function of JTAG port? Explain in brief.

b) State any four features of bluetooth technology.

c) Draw the interfacing diagram of 4 × 4 matrix keyboard with 89C51 microcontroller. Draw the flowchart for detection and identification of key activation.

d) Write program for 89C51 microcontroller in 'C' language to mask the lower four bits of P0 and upper four bits of P1. Combine both ports and output result on port 2.

e) Draw interfacing diagram of stepper motor with 89C51 microcontroller.