22532

21222

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

15 minutes extra for each hour

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) Use of Non-programmable Electronic Pocket Calculator is permissible.

(7) 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) Classify embedded system.

b) Define RISC and CISC.

c) State any two features of IrDA.

d) State any two data types used in C with their range.

e) Define Reliability, Scalability related to RTOS.

f) Draw the format of TMOD register.

g) List various temperature sensors used in industry.

Marks

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

a) Compare Harvard and Von-Neumann architecture.

b) Write 89C51 C program to mask the lower 4 bits of P2 and upper 4 bits of P0. using logical operator.

c) Draw and explain CAN bus with frame format.

d) State features of 89C51 microcontroller.

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

a) Draw labelled diagram to interface 16 × 2 LCD with 89C51. State function of pins

i) RS

ii) RIW

iii) EN

b) Differentiate between general purpose operating system (GPOS) and real time operating system (RTOS).

c) Draw the pin out of RS 232 and describe function of TXD, RXD, DTE and DCE pins.

d) Write 89C51 C program for multiplication of two 8 bit numbers.

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

a) Write C program to send character 'ESY' serially at 9600 baud rate continuously. Assume crystal frequency 11.0592 MHz.

b) Draw and explain USB protocol.

c) Draw interfacing diagram of 3 × 3 matrix keyboard with 89C51.

d) State any four features of zigbee.

e) Draw interfacing diagram of ADC to 89C51 and explain function of following pins SOC, EOC, and OE.

Marks

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

a) Explain watchdog timer and semaphore in detail.

b) Draw the interfacing diagram for temperature measurement using LM35, ADC 0808 with microcontroller 89C51.

c) Write a C program to toggle all bits of port 1 continuously with 60 ms delay in between. Use timer 0 in mode 1 to generate the delay.

The XTAL frequency is 11.0592 MHz.

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

a) Explain pre-emptive and round robin scheduling algorithm in RTOS.

b) Draw the block diagram of embedded system and explain with hardware component.

c) Draw interfacing diagram of DAC to 89C51 and write a 'C' language program to generate sawtooth wave.