17658

11920

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

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

(i) Compare Microprocessor with Microcontroller on the basis of any four factors.

(ii) State functions of Assembler and Emulator.

(iii) Compare following type of communication:

(1) Asynchronous serial and

(2) Synchronous serial

(iv) Sketch interfacing diagram to show interface between stepper motor and 89C51.

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

(i) Sketch basic block diagram of embedded system. State its any two advantages and two disadvantages.

(ii) Explain the concept of 'Dead lock'. Why it occurs? How to avoid it?

P.T.O.

Marks

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

a) State type of SFR used to set priority and to enable or disable interrupt.

b) Write 89C51 'C' program to operate LED after fix interval.

c) Explain role of handshaking signal in RS232c transmitter and receiver.

d) Write a 'C' program to read the status of key connected to port 1 at P1.7. If the key is pressed then send FFh at P2, else send ooh at P2.

e) With suitable example explain semaphore in embedded system.

f) Compare with example hard and soft real time embedded system.

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

a) Give one example of asynchronous communication and for that application Justify "Asynchronous communication is better than synchronous communication".

b) Write 'C' language program to read PO. Exchange it's nibble and send result at P1.

c) Explain the features of RTOS.

d) List out essential design specifications for following type of embedded system:

(i) Stand-alone system

(ii) Networked system

e) Write a 'C' program to read output of ADC. Sketch interfacing diagram showing 89C51 with ADC.

Marks

4. a) **Attempt any <u>THREE</u> of the following :** **12**

(i) List out architectural features of DSP processor. (any four features)

(ii) Compare USB with Bluetooth protocol on the basis of any four factors.

(iii) State the importance of following design specification in embedded system.

(1) Memory

(2) Reliability

(3) Flexibility

(4) Safety

(iv) Explain any one scheduling algorithm used in RTOS.

b) **Attempt any <u>ONE</u> of the following :** **6**

(i) Write 89C51 'C' program to transfer the message 'ESC' serially at fixed baud rate. Assume suitable baud rate, data size and no. of stop bits.

(ii) Draw labelled circuit diagram to interface LCD with microcontroller 89C51. Describe functions of various pins of LCD.

5. **Attempt any <u>FOUR</u> of the following :** **16**

a) Write step by step process to develop and execute microcontroller program using Keil.

b) List out features of 802.11 protocol.

c) Draw labelled circuit diagram to interface 4 × 4 matrix keyboard with microcontroller 89C51.

d) Explain inter-task communication feature of RTOS in embedded system.

e) State role of In-circuit emulator and JTAG port in software development.

f) Draw interfacing diagram of relay with 89C51.

Marks

6. Attempt any <u>FOUR</u> of the following : 16

a) List out features and state operating procedure of program downloading tool ISP.

b) Compare I^2C with CAN on the basis of four factors.

c) Write a 'C' program to operate DC motor interfaced to 89C51.

d) Sketch labelled diagram to interface DAC with 89C51 and write program to generate square wave signal.

e) Write operator in 'C' for:

(i) Addition

(ii) Anding

(iii) Multiplication

(iv) NOT operation