

22532

21222R

3 Hours / 70 Marks

Seat No.

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- 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) 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) List any four features of ARM microcontroller.
  - b) List any four features of 8051 microcontroller.
  - c) Compare synchronous and asynchronous communication.
  - d) Draw format of IE and IP sfrs.
  - e) List any four features of RTOS.
  - f) List any two arithmetic and two logical operators in C.
  - g) Draw interfacing diagram of one digit common anode 7-seg display with 8051.
  
2. **Attempt any THREE of the following:** **12**
  - a) Draw block diagram of an Embedded System.
  - b) Write C language program for 1ms delay. Use timer 1 in mode 1. ( $f_{osc} = 12\text{MHz}$ )
  - c) Explain PCI-X communication protocol.
  - d) Classify Embedded Systems.

P.T.O.

3. Attempt any THREE of the following: 12
- Interface  $16 \times 2$  LCD with  $8051 \mu\text{C}$ .
  - Explain intertask communication and multitasking.
  - Explain IZC communication protocol.
  - Write C language program to send 'MSBTE' on TXD line of  $8051 \mu\text{C}$ . Assume  $\text{BR} = 9600 \text{ bps}$  and  $f_{\text{osc}} = 11.0592 \text{ MHz}$ .
4. Attempt any THREE of the following: 12
- Write C language program to add 25H and 3BH.
  - Draw minimum interface diagram of  $\mu\text{C}$  with PC using MAX232.
  - Interface stepper motor with 8051 and write 'C' program to rotate it clockwise continuously.
  - Explain Zigbee communication protocol.
  - Draw interface diagram of DAC0808 with 8051 and write C language program to generate triangular wave.
5. Attempt any TWO of the following: 12
- Compare general OS and RTOS.
  - Interface LED at P1.0 and Key at P2.0 and write C language program to turn ON LED when key pressed.
  - Write C language program to read P1 data, compliment it and send to P2.
6. Attempt any TWO of the following: 12
- Explain characteristics of RTOS.
  - State the characteristics of an embedded system.
  - Draw interface diagram of  $4 \times 4$  matrix keyboard and write logic to scan the key pressed (No program).
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