

22532

23124

3 Hours / 70 Marks

Seat No.

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- Instructions* – (1) All Questions are *Compulsory*.
(2) Figures to the right indicate full marks.
(3) Assume suitable data, if necessary.
(4) Use of Non-programmable Electronic Pocket Calculator is permissible.
(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) Define RISC and CISC.
 - b) List any two applications of Harvard architecture.
 - c) Illustrate any two data types used in C with their ranges.
 - d) Draw format of TMOD register.
 - e) State any two application of bluetooth.
 - f) List various temperature sensors used in industry.
 - g) Define the terms : scalability, predictability related to RTOS.
2. Attempt any THREE of the following : 12
- a) Compare Harvard and Von Neuman architecture.
 - b) State any two application for following
 - i) Small scale embedded system.
 - ii) Medium scale embedded system.

P.T.O.

- c) Write C language program to toggle all bits of P0, P1, P2 and P3 continuously with certain delay.
- d) Draw 9 pin RS 232C connector and state significance of DTR and DSK signals.

3. Attempt any THREE of the following : 12

- a) Write a C language program to transfer message “MSBTE” serially at 9600 baud rate. Assume crystal frequency 12 MHz.
- b) Compare between CAN and I²C protocols on the following points.
 - i) Data Transfer rate
 - ii) Number of fields
 - iii) Addressing bits
 - iv) Applications
- c) Draw interfacing of ADC with 89C51 and explain function of SOC, EOC and OE.
- d) Compare general purpose operating system and RTOS (four points)

4. Attempt any THREE of the following : 12

- a) Describe how assembly language can be included in 89C51 C program. Give an example.
- b) Draw and explain USB protocol.
- c) State any four features of Zigbee.
- d) Draw interfacing diagram of 4×4 matrix keyboard with 89C51.
- e) Write a ‘C’ language program to rotate stepper motor by 90° clockwise. Assume step angle of 1.8° and 4 step sequence.

5. Attempt any TWO of the following : 12
- a) Explain watchdog timer and semaphore in detail.
 - b) Write a 89C51 C program to display 'WELCOME' on 16×2 LCD display.
 - c) Write C language program to generate square wave of 5 KHz on pin P1.5 of 89C51.
6. Attempt any TWO of the following : 12
- a) Explain six characteristics of embedded system.
 - b) Explain pre emptive and round robin scheduling algorithm in RTOS.
 - c) Draw interface diagram of 7 seg LED display to 89C51 and write a C program to display 0-9 continuously.
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