

22532

11920

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) 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) List out four types of embedded systems.
 - b) State four advantages of embedded system.
 - c) State the use of MAX 232 in communication.
 - d) Illustrate any two logical operators used in C with their examples.
 - e) State two examples of RTOS.
 - f) Develop a 'C' program to transfer the data from port P0 to port P1.
 - g) Sketch pin-out diagram of LM35 and label it's pin.

P.T.O.

- 2. Attempt any THREE of the following :** **12**
- a) Compare features of PIC and AVR microcontrollers (any four)
 - b) Write a C language program to operate port 0 and port 2 as output port and port 1 and port 3 as input port.
 - c) Compare synchronous and asynchronous communication. (any four points)
 - d) Explain the need to consider following factors in design matrix of embedded system:
 - (i) Processor
 - (ii) Memory
 - (iii) Power
 - (iv) Non - recurring engineering cost.
- 3. Attempt any THREE of the following:** **12**
- a) Sketch circuit diagram showing interfacing of one 7-segment display to 89C51. Write a 'C' program to display 'F' and 'Fi' alternately.
 - b) Explain the term 'Deadlock'. State reason of occurrence.
 - c) Explain the process of handshaking in RS232 standard based communication.
 - d) Write a 'C' language program to mask the upper four bits of the data given in port 0 and write the answer in port 1.
- 4. Attempt any THREE of the following:** **12**
- a) Write 'C' program to generate delay of 50msec for microcontroller 89C51 with crystal frequency of 11.0592 MHz.
 - b) List out eight features of USB.
 - c) Draw the interfacing diagram of ADC with 89C51 and state the function of SOC, EOC and OE pins.
 - d) Explain 'CAN' bus protocol and list out it's two applications.
 - e) Sketch interfacing diagram to interface LCD display with 89C51.

- 5. Attempt any TWO of the following: 12**
- a) Explain resource allocation and interrupt handling function of RTOS.
 - b) Write a 'C' language program for 89C51 to generate triangular waveform.
 - c) Write a 'C' language program for serial communication to transfer letter 'M' serially at 9600 baud continuously.
- 6. Attempt any TWO of the following: 12**
- a) List out characteristics of RTOS and explain any four characteristics
 - b) Compare :
 - (i) RISC with CISC processor
 - (ii) Harward with Von Neuman architecture.
 - c) Explain with sketch interfacing of stepper motor with 89C51. Write 'C' language program to rotate the motor clockwise.
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