22532

24225

3 Hours / 70 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. Attempt any FIVE of the following : **10**

a) List features of PIC microcontroller.

b) Classify embedded system.

c) State the protocol used for :

i) Modems

ii) Automation and control

d) List any four software development tools used in an embedded system.

e) State any four specifications of RTOS.

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

g) State the function of LM35, Write its any two features.

Marks

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

a) Compare Harvard and Von-Neumann Architecture.

b) Write a C program to toggle all bits of Port-0 continuously with 100 ms delay in between. Use timer 0 in mode 1 to generate the delay. The XTAL frequency is 11.0592 MHz.

c) Compare Zigbee and Bluetooth on the basis of following points :

i) Modulation Technique

ii) Communication Range

iii) Power consumption

iv) IEEE standard

d) State features of 89C51 microcontroller.

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

a) Draw labeled interfacing diagram to interface 4×4 matrix keyboard with 89C51 μc.

b) Differentiate between general purpose operating system (GPOS) and Real time operating system (RTOs).

c) Draw the 9 pin RS232 connector and state the significance of DTR and DSR signals.

d) Write 89C51 'C' program to transfer character 'DATTATRAYA' serially at 9600 baud rate continuously, use 8 bit data and 1 stop bit. Assume XTAL frequency of 11.0592 MHz.

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

a) Write 'C' program to check bit P1.2, if it is high send 55 H to PO, otherwise send AAH to P2.

b) Describe CAN bus with frame format.

c) Write 895C1 'C' program to rotate stepper motor 90° clockwise direction motor has step angle 1.8° use the stepper motor in full step sequence.

d) State any four features of CAN protocol.

e) Draw labeled interfacing diagram of relay with 89C51 microcontroller.

Marks

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

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

b) Draw interfacing diagram of 16*2 LCD with 89C51 and state the functions of following pins of LCD display

i) RS

ii) R/W

iii) EN

c) Write 89C51 'C' program to generate square wave of 10 KHz on pin P2.4 using timer 0, mode 2 of operation. Assume XTAL frequency as 12 MHz.

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

a) Explain watchdog timer and semaphore in detail.

b) Explain in detail any six characteristics of embedded system.

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

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