17658

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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) Assume suitable data, if necessary.

(5) Use of Non-programmable Electronic Pocket Calculator is permissible.

(6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

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

(i) State and describe any four design metrics of embedded system.

(ii) Draw interfacing diagram of 4*4 matrix keyboard with 89c51 μc.

(iii) Describe the function of following software development tools for 89c51 microcontroller.

1) Compiler

2) Linker

3) Debugger

4) Crosscompiler

(iv) Compare Von Neumann and Hardware architecture.

Marks

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

(i) List any six data types in Embedded 'C' with their size in bits and data range.

(ii) Draw interfacing diagram of ADC with 89c51 microcontroller and explain function of following pins of ADC.

1) SOC,

2) EOC,

3) OE

(iii) State different scheduling algorithms of RTOS and describe Round Robin scheduling algorithm.

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

a) Compare synchronous and asynchronous type of serial communication.

b) State any two features of IDE and ICE.

c) State any two advantages and two applications of Embedded system.

d) Draw and describe architecture of RTOS.

e) Draw interfacing diagram of LCD with microcontroller 89c51.

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

a) Draw interfacing diagram of DAC with 89c51 μc and write 'c' language program to generate triangular waveform using DAC.

b) Write 'C' language program to generate square wave of frequency 5 KHz on p3.5 pin of μc 89c51. Use timer 1, mode 1 to generate delay. Assume XTAL = 11.0592 MHz.

c) Write 'C' language program to rotate stepper motor in clockwise direction continuously. Draw interfacing diagram of stepper motor with 89c51 μc.

Marks

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

(i) Compare bluetooth and zigbee wireless communication protocols.

(ii) State any four features of USB serial communication protocol.

(iii) Draw 8 bit format of TMODSFR and explain how modes of timer can be selected using TMOD.

(iv) Describe the function of following:

1) Simulator

2) Emulator

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

(i) Write 'C' language program to toggle bit P1.5 of part 1 continuously after 50 ms delay. Generate delay using for loops.

(ii) State classification of Embedded system and describe any two types with example.

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

a) Compare RISC and CISC.

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

c) Describe following wireless communication protocols:

(i) IrDA,

(ii) WiFi

d) Describe the features of I2C serial communication protocol.

e) Draw interfacing diagram of 7 segment LED display with microcontroller 8051.

Marks

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

a) Draw block diagram of Embedded system.

b) Describe the function of CAN bus protocol.

c) State any four specifications of RTOS.

d) Differentiate between general purpose operating system (GPOS) and real time operating system (RTOS).

e) Describe hard and soft real time operating system with example.