17626

11920

3 Hours / 100 Marks Seat No. | | | | | | | | |

Instructions : (1) All Questions are *compulsory.*

(2) Illustrate your answers with neat sketches wherever necessary.

(3) Figures to the right indicate full marks.

(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 THREE of the following : **12**

(a) Describe the function of program counter and DPTR.

(b) Explain the following assembler directives :

(i) DB (ii) ORG

(iii) EQU (iv) END

(c) List any eight application of Embedded system.

(d) What is deadlock in RTOS ? Explain with suitable example.

(B) Attempt any ONE of the following : **6**

(a) Write 8051 program in assembly language to generate square wave of 10 kHz on pin P2.7 using timer 0. Assume crystal frequency as 11.0592 MHz.

(b) Draw the labelled diagram to interface DAC 0808 with 8051. Write assembly language program to generate saw tooth wave continuously.

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

(a) State the alternative function of PORT 3 pins of 8051 microcontroller.

(b) Describe any two addressing mode with suitable example.

(c) Draw the structure of port 0 of 8051. State the need of pull up resistors.

(d) Draw the labelled diagram to interface stepper motor with 8051.

(e) State any eight advantages of embedded system.

(f) Describe the need of inter-task communication in detail.

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

(a) Draw the format of PSW register of 8051 and describe all bits.

(b) Write ADD instruction in following addressing mode :

(i) Direct Addressing Mode

(ii) Indirect Addressing Mode

(iii) Register Addressing Mode

(iv) Immediate Addressing Mode

(c) Explain mode 0 of 8051 Timer/counter with suitable diagram.

(d) Draw the labelled diagram to interface 4 × 4 matrix keyboard with 8051.

(e) Describe the concept of simulator & emulator in Embedded system.

(f) Describe the concept of starvation with suitable example.

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

(a) Draw the labelled format of TMOD Register and describe each bit.

(b) Write 8051 assembly language program to multiply two 8 bit numbers which are stored in external RAM location 3000 H & 3001 H and store the LSB of result in 3002 H & MSB in 3003 H location of external memory.

(c) Write 8051 'C' program to transfer the message "MSBTE" serially at baud rate 4800, 8 bit data, 1 stop bit.

(d) Draw the labelled diagram to interface 2 × 16 LCD display with 8051.

(B) Attempt any ONE of the following : **06**

(a) Explain embedded software development cycle with suitable diagram.

(b) Explain the need of RTOS in embedded system. Also state any four difference between GPOS and RTOS.

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

(a) Draw the labelled format of SCON SFR and explain the function of each bit.

(b) Describe function of the following 8051 instructions :

(i) SETB C

(ii) SWAP A

(iii) MUL AB

(iv) MOV A @ DPTR

(c) Draw the format of IE SFR and explain the function of each bit.

(d) Draw the labelled diagram to interface ADC0808 with 8051.

(e) Describe compiler and debugger.

(f) State any four scheduling algorithms in RTOS and explain Round Robin scheduling algorithm with suitable example.

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

(a) Draw labelled architecture of 8051 microcontroller.

(b) Write 8051 program in 'C' to read byte of data from port 0. If it is greater than 99 H then send it to P1, otherwise send it to P2.

(c) Write assembly language program for 8051 to toggle pin P1.1 of port 1 after receiving external interrupt INT1.

(d) Draw the labelled diagram to interface seven segment display with 8051.

(e) Explain in brief.

(i) Device Programmer

(ii) Target board

(f) Describe deadlock prevention in detail.
