

(3 Hours)



[Total Marks:80

N.B. :

- (1) Question No. 1 is compulsory.
- (2) Attempt any three questions out of remaining five questions.
- (3) Assume suitable data if necessary

1. Answer any five in brief 20
 - a. Define embedded system. Explain various characteristics of embedded system
 - b. Interface one 7-segment LED display to PIC18F4520 and write instructions/program to display '8' on it.
 - c. Explain following instructions with example
 - i. DECFST
 - ii. BTFSS
 - d. Explain features of IIC protocol
 - e. Explain design challenges in embedded systems
 - f. With suitable example explain priority inversion
2. a. Draw and explain programming model of PIC18F4520. 10
 - b. Write a program to convert HEX number to decimal number using PIC18F assembly language or C programming. Explain program logic in detail with example. 10
3. a. Assume that XTAL=10MHz, write a program to generate a square wave of 50Hz frequency on PORTB.0. Use timer1 in 16bit mode with maximum presalar allowed. 10
 - b. Write a program for PIC18 to transfer the letter 'A' serially at 9600 baud continuously. Assume XTAL=8Mhz
4. a. Interface 4x4 matrix keys to PIC18F and write a program to identify which key is pressed. Send detected key on PORTD. 10
 - b. What is task? Explain various task scheduling algorithms. 10

[Turn Over

5. a. Interface 8 bit DAC to PIC18F and write a program to generate sine waveform. 10
 b. Explain SPI module of PIC18F4520. Interface serial EEPROM with PIC18F using SPI module. 10
6. Write short note on any two 20
 a. ADC module of PIC18F
 b. Compare modes of CCP module
 c. Memory organization of PIC18F.

PIC 18f4520 SFRS

Reg. Name	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
INTCON	GIE/GIH	PEIE/GIEL	TMROIE	INTOIE	REIE	TMROIF	INTOIF	RBIF
INTCON2	RBPU	INTEDG0	INTEDR1	INTEDG2		TMR0IP		RBIP
INTCON3	INT2IP	INT1IP		INT2IE	INT1IE		INT2IF	INT1IF
T1CON	RD16	T1RUN	T1CKPS1	T1CKPS0	T1OSCEN	T1SYNC	TMR1CS	TMR1ON
T2CON	---	T2OUTPS3	T2OUTPS2	T2OUTPS1	T2OUTPS0	TMR2ON	T2CKPS1	T2CKPS0
ADCON0	----	-----	CHS3	CHS2	CHS1	CHS0	GO/DONE	ADON
ADCON1	----	----	VCFG1	VCFG0	PCFG3	PCFG2	PCFG1	PCFG0
ADCON2	ADFM	---	ACQT2	NDB	ACQT0	ADCS2	DACS1	ADCS0
TXSTA	CSRC	TX9	TXEN	SYNC	SENDB	BRGH	TRMT	TX9D
RCSTA	SPEN	RX9	SREN	CREN	ADDEN	FERR	OERR	TX9D
IPR1	PSPIP	ADIP	RCIP	TXIP	SSPIP	CCP1IP	TMR2IP	TMR1IP
IPR2	OSCFIP	CMIP	-----	EEIF	BCLIP	HLVDIP	TMR3IP	CCP2IP
PIE1	PSPIE	ADIE	RCIE	TXIE	SSPIE	CCP1IE	TMR2IE	TMR1IE
PIE2	OSCFIE	CMiE	-----	EEIE	BCLIE	HLVDIE	TMR3IE	CCP2IE
PIR1	PSPIF	ADIF	RCIF	TXIF	SSPIF	CCP1IF	TMR2IF	TMR1IF
PIR2	OSCFIF	CMIF	-----	EEIF	BCLIF	HLVDIF	TMR3IF	CCP2IF