

Total No. of Questions : 8]

SEAT No. :

PA-1460

[Total No. of Pages : 2

[5926]-76

T.E. (Electrical )

**ADVANCED MICROCONTROLLER AND EMBEDDED  
SYSTEM**

**(2019 Pattern) (Semester - I) (Elective - I) (303145 A)**

*Time : 2½ Hours ]*

*[Max. Marks : 70*

*Instructions to the candidates:*

- 1) Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8.
- 2) Neat diagram must be drawn wherever necessary.
- 3) Figures to the right side indicate full marks.
- 4) use of calculator is allowed.
- 5) Assume suitable data, if necessary.

- Q1)** a) How DC motor speed control is achieved using PWM mode of CCP module of PIC18F458. [8]  
b) Draw CCPICON and list the steps involved in programming PIC18F458 microcontroller in PWM mode. [9]

OR

- Q2)** a) List out timers used for CCP module in PIC18F458. Also explain CCP registers used in detail. [8]  
b) Write embedded C program to generate PWM of 5KHz with 40% duty cycle and Prescaler N = 4. [9]

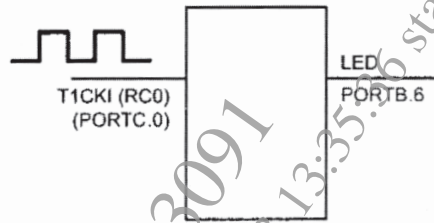
- Q3)** a) Write a note on enabling and disabling interrupts and steps to enable interrupts in PIC 18. [9]  
b) Assuming crystal frequency = 10MHz, write a program in C language to generate square wave form with a frequency of 25kHz on PORTB.4. Use timer 0 in 8bit mode without a Prescaler. [9]

OR

- Q4)** a) Write a short note on interrupt structure of PIC18F458 microcontroller. [9]  
b) Write a C Program for PIC18 toggle the LED connected to pin 7 of the PORT B every time INT1 is activated by a pulse generator connected at

**P.T.O.**

INTI (RB1). The program will toggle the LED on falling edge of the pulse. Assume XTAL = 10 MHz. [9]



**Q5) a)** Explain in detail the function of following flags related to on board ADE of PIC Microcontroller. [8]

- i) ADIF
- ii) Go/Done
- iii) ADFM
- iv) ADON

b) With the help of interfacing diagram and flow chart, explain how PIC microcontroller can be used to measure temperature using LM35 sensor. [9]

OR

**Q6) a)** Explain features of on-board ADC of PIC18F458. Also explain in detail the functions of ADIF and ADFM bits. [8]

b) Draw a neat diagram and flow chart, explain AC voltage measurement using PIC microcontroller. [9]

**Q7) a)** Write a C program for the PIC18 to transfer the message "A" serially at 9600 baud, 8-bit data, 1 stop bit. Do this continuously. Assume XTAL=10MHz. [9]

b) Compare synchronous and asynchronous serial communication. Also explain the concept of baud rate with example. [9]

OR

**Q8) a)** Draw and explain the block diagram of USART transmitter in PIC18. [9]

b) Explain the SPBRG register uses. Also find the value to be loaded in SPBRG register to have baud rate of 4800 and Fosc =10MHz. Assume asynchronous mode and low baud rate. [9]

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