



OR

- 6 a. Explain the bit status of TMOD register. (05 Marks)  
 b. Write an assembly program to generate square wave with ON time = 5 ms and OFF time = 20 ms on all pins of port-1. Use Timer0 in Mode1. Assume crystal frequency = 11.0592 MHz. Calculate the duty cycle. Explain TH0, TL0 and TMOD calculations. (10 Marks)  
 c. Explain the characteristics and operations of mode-2 program in 8051 timer. (05 Marks)

Module-4

- 7 a. Explain the bit status of SCON register. With XTAL = 11.0592 MHz, calculate the TH1 value needed for the baud rates; (i) 9600 (ii) 2400. (10 Marks)  
 b. A square wave is being generated at pin P1.2. This square wave is to be sent to a receiver connected in serial form to 8051. Write an assembly language program for this. Explain the calculations of TMOD, SCON, TH1 value. Assume Timer0 and Timer1 in Mode2. Assume baud rate = 9600 and XTAL = 11.0592 MHz. (10 Marks)

OR

- 8 a. Compare interrupts versus polling methods, in 8051 interrupts. (05 Marks)  
 b. Explain the 6 interrupts in 8051. Also state its ROM location. (05 Marks)  
 c. Write an assembly program to get data continuously from port 0 and send it to port P1 while simultaneously creating a square wave of 200  $\mu$ s period on P2.1 Use Timer0 to create square wave. Assume XTAL = 11.0592 MHz. Explain IE, TMOD, TH0 calculations. (10 Marks)

Module-5

- 9 a. State advantages of LCD over multi-segment LEDs. Explain the architecture and working of 14 pin LCD. Draw its schematic diagram. (10 Marks)  
 b. Explain the interfacing circuit of DAC to 8051  $\mu$ C. If  $I_{ref} = 2$  mA, calculate the DAC output if all the inputs to DAC are high. (05 Marks)  
 c. Calculate  $V_0$  of sawtooth wave (with respect to DAC interface) with the following program. Assume  $R_F = 5$  K $\Omega$  in I/V converter in DAC circuit interfacing. [Refer fig.Q9(c)]

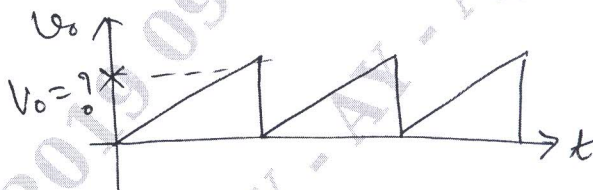


Fig.Q9(c)

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Program: MOV A, #00h
        MOV P1, A
GO: INC A
        SJMP GO
  
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(05 Marks)

OR

- 10 a. Explain the construction and working of stepper motor. Also explain 2- $\phi$ , 4 step stepping sequence, step angle and steps per revolution. (10 Marks)  
 b. Explain the control word format of 8255 IC. What is the control word for all the ports as output ports? (05 Marks)  
 c. Explain the principle of opto isolator and its purpose in interfacing to 8051  $\mu$ C. (05 Marks)

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