Total No. of Questions : 8]

SEAT No. :

**PC2791**

[Total No. of Pages : 2

# [6352]-15
## S.E. (Electrical Engineering)
## FUNDAMENTALS OF MICROCONTROLLER AND APPLICATIONS
## (2019 Pattern) (Semester - IV) (203149)

*Time : 2½ Hours]* *[Max. Marks : 70*

***Instructions to the candidates:***

1) ***Solve Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q6, Q.7 or Q.8.***
2) ***Figures to the right indicate full marks.***
3) ***Neat diagrams must be drawn wherever necessary.***
4) ***Assume suitable additional data, if necessary.***
5) ***Use of non-programmable calculator is allowed.***

***Q1)*** a) Explain TMOD register. **[4]**

b) Write a program in C to toggle all bits of Port P1 with some delay. Use a suitable 'for' loop for delay generation. **[6]**

c) Write a program in C language to generate a square waveform of frequency 10 Hz at pin P1.4 of 8051. Use Timer 0 in mode 1. Assume crystal frequency as 11.0592 MHz. **[8]**

OR

***Q2)*** a) State and explain various data types used in embedded C programming. **[4]**

b) Explain in detail steps to program timer 0 of 8051 in mode 1. **[6]**

c) Write a program in C to toggle the lower 4 bits of Port 1 with a delay of 50 msec.Use Timer 1 in mode 1 to generate the delay. Assume crystal frequency = 11.0592 MHz. **[8]**

***Q3)*** a) Describe in short IE register. **[3]**

b) A switch is connected to INT0 pin and a LED is connected to pin P 1.5. Write a program in C to light up the LED when the switch is made ON. (The LED will glow when the pin is made HIGH). **[6]**

c) Describe the features of ADC 0809 and show the interfacing of ADC 0809 with 8051. **[8]**

OR

***P.T.O.***

***Q4)*** a) State the sources of interrupts in 8051 along with the corresponding interrupt vector table addresses. **[3]**

b) Explain the steps to be taken for programming ADC 0809 using C language. **[6]**

c) Write a program in C to do the following. **[8]**

Turn ON all LEDs connected to Port P1 when INT0 interrupt occurs.
Turn OFF all LEDs connected to Port P1 when INT1 linterrupt occurs.

***Q5)*** a) Explain following terms with respect to Serial communication- **[4]**

i) RS232

ii) UART

b) What are AT Commands? Explain any four AT commands used in GSM. stating its syntax and use. **[6]**

c) Write a program in C to transfer the letter 'S' serially with a baud rate of 9600. Use Mode 1 of serial communication. Crystal frequency =11.0592 MHz. **[8]**

OR

***Q6)*** a) Write the steps to receive data serially in 8051. **[4]**

b) Explain in detail SCON Register. **[6]**

c) What is GSM? With a neat diagram. explain interfacing of GSM module (SIM 800 / 900) with 8051 microcontroller. **[8]**

***Q7)*** a) Explain with neat diagram. switch and LED interfacing with 8051. **[3]**

b) With the help of a neat block diagram, explain AC voltage measurement using 8051 microcontroller. **[6]**

c) A stepper motor is connected to lower 4 bits of Port 2 of 8051. Write a program in C to rotate the motor continuously in clockwise direction. **[8]**

OR

***Q8)*** a) Explain with neat diagram, relay interfacing with 8051. **[3]**

b) A switch is connected to pin P1.0 and two LEDs are connected to pins P1.1 and P1.2 in common cathode mode. Write a program in C to glow both the LEDs when switch is made ON. **[6]**

c) With thc help of a neat diagram, explain interfacing of stepper motor with 8051 along with suitable driver circuit/IC. **[8]**

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