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Roll No. : .....

**328653(28)**

**B.E. (Sixth Semester) Examination 2020**

*APR-MAY 2022*

**(New Scheme)**

**(Electronics & Telecommunication Branch)**

**MICROCONTROLLER & EMBEDDED SYSTEMS**

*Time Allowed : Three hours*

*Maximum Marks : 80*

*Minimum Pass Marks : 28*

*Note : Attempt all questions. The first part (a) in each question is compulsory which is of 2 marks. Attempt any two parts from the rest three (b), (c) and (d) each is of 7 marks.*

**Unit-I**

1. (a) Write the difference between 8051, 8052 & 8031 version of microcontrollers.

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- (b) Compare the RAM memory organization of mcs-51 & 52 versions of Microcontroller. 7
- (c) What do you mean by Von Neumann and Harvard architecture? Draw the architectural block diagram of MCS-51 microcontroller and discuss what kind of architecture it belongs? 7
- (d) What do you mean by addressing mode? What are the different addressing modes of 8051 briefly explain with suitable example. 7

**Unit-II**

- 2. (a) What is the use of TCON register in timer/counter operation? 2
- (b) What are the different type of interrupt in 8051 discuss it with detail of interrupt structure? 7
- (c) Write an assembly language program to generate a square wave signal of clock frequency 2.5 khz on P 2.5 bit of the microcontroller and meanwhile read data from Port 1 and send its complement value to the port 3. 7
- (d) Write the steps of timer/counter programming of 8051 in auto-reload mode. 7

**Unit-III**

- 3. (a) Briefly explain the use of SCON in serial communication. 2
- (b) Write the programming steps of serial data transmission and reception in 8051. 7
- (c) Write an Assembly language program to transmit a string repetitively serially on TX line of 8051 with baud rate 9600 let the string residing at the ram memory location 50 H onwards and null character 0 at the end of it.  
A string at Ram location 50 H : CSVTU BHILAI '0'. 7
- (d) Write short notes on RS232 and MAX232 Standards used in serial communication. 7

**Unit-IV**

- 4. (a) What do you mean by key de-bouncing in key board interfacing? 2
- (b) Interface ADC with 8051 and write an assembly language program to receive 50 data bytes from output of ADC and store it to the memory location 40h onwards. 7

- (c) Interface a Stepper motor of 200 rotor tooth with 8051 microcontroller and write an assembly language program to rotate it, 5 cycle in clockwise and 5 cycle in anticlockwise direction. 7
- (d) Interface LCD Derive with 8051 to display "CSV TU" in it. 7

#### Unit-V

5. (a) What do you mean by embedded system? 2
- (b) Little elaborate on the different real time characteristics of embedded system. 7
- (c) Highlight the future design challenges of the embedded system. 7
- (d) What are the development stages of the embedded system? 7