

Printed Pages – 6

Roll No. : .....

**328653(28)**

**B. E. (Sixth Semester) Examination, April-May 2021**

**(New Scheme)**

**(Et & T Branch)**

**MICROCONTROLLER & EMBEDDED SYSTEMS**

***Time Allowed : Three hours***

***Maximum Marks : 80***

***Minimum Pass Marks : 28***

***Note : All questions are compulsory and carry equal marks. Part (a) is compulsory, attempt any two parts from (b), (c) and (d) of each question.***

**Unit-I**

1. (a) What do you understand from OTP microcontroller?  
What are the advantages using OTP microcontrollers? 2

[ 2 ]

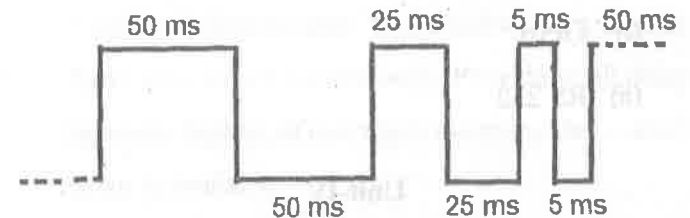
- (b) Write a table of features of MCS51 family for any six microcontrollers manufactured by DALLAS semiconductors. Which microcontrollers among these have NVRAM and UVRAM program memory? 7
- (c) Draw a basic practical Application circuit using 8051 showing clocking circuit, power on reset circuit and pull up register network for port 0. Why pull up registers are necessary for port 0 only and not for other ports of 8051? Explain using proper port structure for port 0? 7
- (d) Draw the RAM structure for 8051. In 8052, address space 80 H to FFH is used for SFR's as well as RAM then, how both of them will be accessed using same addresses? Explain with examples of instructions used for accessing RAM location and SFR assigned with same address. 7

### Unit-II

2. (a) Define Interrupts and Polling in very brief. 2

[ 3 ]

- (b) In certain industry a fire alarm system is implemented which produces high to low transition pulse at output whenever the smoke sensor detect smoke due to fire. If this high to low transition pulse is applied at port pin P 3.2 (INT 0) of 8051, write software to sound an alarm and flash indicator lamp continuously unit reset of the fire system. 7
- (c) If a crystal frequency for 8051 microcontroller is 16 MHz, generate 100 cycles of following waveform at port pin P 2.0. 7



- (d) Write a note on MODE 3 (split timer mode) of timer in 8051. 7

### Unit-III

3. (a) What is data framing? Show Framing of character "B" between one start and one stop pulse. 2

[ 4 ]

- (b) Write a program to transfer a string of data "Wish you a very happy Birthday". Serially at the baud rate 9600. XTAL is 11.0592 MHz and data string is to be taken from code memory from an address 0400 H. 7
- (c) Write a program to receive a data string "Thank you very much". Serially at the baud rate 9600. XTAL is 11.0592 MHz. Save the received data string at an address 1000H of external memory. 7
- (d) Write a note on any **one** bus standard : 7
- (i) GPIB
- (ii) RS 232

Unit-IV

4. (a) Write a function of  $\overline{EA}/V_{pp}$  and  $\overline{PSEN}$  pin in memory interfacing. 2
- (b) For a certain application it is required to have 256 KB of NVRAM data memory in a 8051 memory system. Draw the memory interfacing hardware and show how 256 KB memory is accessed using 64 KB blocks. 7

[ 5 ]

- (c) A Port pin P 1.1 is connected to a switch SW. Assuming that a stepper motor connected to P 2.0 – P 2.3 has step angle  $2^\circ$ , write a program to do following : 7
- (i) If SW = 0, Move stepper motor clockwise for one complete revolution.
- (ii) If SW = 1, Move stepper motor anticlockwise for one complete revolution. 7
- (d) Draw hardware circuit diagram for a 7 segment display system using 8051 and one common cathode 7 segment display unit. Write software to display digits from 0 to 9 continuously. Provide small delay between displays of two digits assuming that a small delay is available. 7

Unit-V

5. (a) Define real time embedded system. 2
- (b) Design an embedded system (block diagram only) for any real life application. Explain its functioning in detail. 7

- (c) Write all the characteristics of a real time embedded system. 7
- (d) What are different design phase challenges and issues during development of an embedded system? 7