

**B.Tech. – VIEP – ELECTRICAL ENGINEERING
(BTELVI)**

00322 Term-End Examination

December, 2017

BIEE-010 : MICROCONTROLLERS

Time : 3 hours

Maximum Marks : 70

Note : Answer any *seven* questions. All questions carry equal marks. Assume data wherever required.

1. (a) Enlist the salient features of 8051 microcontrollers. 5
- (b) Explain various Program Status Word (PSW) registers. 5
2. (a) Why are the Program Counter (PC) and Data Pointer (DPTR) registers of 8051, 16-bit wide, whereas the 8051 stack pointer register is only 8-bit wide ? 5
- (b) List the factors to be considered while going for ROM, EPROM, EEPROM and Flash memory versions of microcontroller devices. 5

- 3. (a)** State the addressing modes used in each of the following instructions : 5
- (i) MOV A, #30H
 - (ii) MOV R1, @40H
 - (iii) ADD A, @R2
 - (iv) MOV X @ DPTR, A
 - (v) ANL 46H, #23H
- (b) What are the instructions that can access the program memory ? 5
- 4. (a)** Write a sequence of instructions that sets the AC flag. 3
- (b) What happens in the following examples ? 7
- (i) SJMP \$
 - (ii) MOV SP, #74
 - (iii) JZ FEH
 - (iv) JC 02
 - (v) INC @ R3
 - (vi) DEC 51H
 - (vii) CPL 91H
- 5. (a)** List all the JUMP and CALL instructions. Describe conditional JMP instructions. 5
- (b) Write a program to measure the width of a pulse appearing at pin INT0. 5

6. (a) Explain the importance of T1 flag. 5
- (b) With XTAL = 11.0597 MHz, find the TH1 value needed to have the following baud rates : 5
- (i) 9600
- (ii) 2400
- (iii) 1200
7. Assuming that XTAL = 22 MHz, write a program to generate a square wave of frequency 1 kHz on pin P1.2. 10
8. Assume that a 1-Hz external clock is being fed into pin T1 (P3.5). Write a C program for counter 1 in mode 2 (8-bit auto reload) to count up and display the state of the TL1 count on P1. Start the count at 0H. 10
9. Write a C program for the 8051 to transfer the letter "A" serially at 4800 baud continuously. Use 8-bit data and 1-stop bit. 10
10. A switch is connected to pin P2.7. Using a simulator, write a program to monitor the status of SW and perform the following : 10
- (a) If SW = 0, the DC motor moves clockwise.
- (b) If SW = 1, the DC motor moves counter-clockwise.