

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

00126

**Term-End Examination**

**June, 2016**

**BIEE-010 : MICROCONTROLLERS**

*Time : 3 hours*

*Maximum Marks : 70*

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

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1. (a) How are embedded microcontrollers different from embedding microprocessors ? Explain with technical justification and application. 5
- (b) Explain RISC and CISC. Which one is most suited to Intel-51 microcontroller and why ? 5
2. (a) What is Special Function Register (SFR) of 51 microcontroller ? List all the SFRs and explain SBUF, IP and PCON. 5
- (b) Describe and draw the architecture of Intel-51, 8-bit microcontroller. 5

3. (a) Draw and explain 8051 connection to ADC 0804 with self-checking mode. 5
- (b) Draw and explain 8051 connection to external RAM ( $8K \times 8$ ). 5
4. (a) Draw a schematic diagram of 8051 interfaced with unipolar stepper motor. Give reasons why one needs driver IC or circuit for interfacing a stepper motor with 8051. 6
- (b) Assuming that XTAL = 11.0592 MHz, write a program to generate a square wave of 2 kHz frequency on pin P1.5. 4
5. Answer the following questions :  $5 \times 2 = 10$
- (a) What is the function of ALE signal ?
- (b) Why are pull-up registers necessary with port P0 in 8051 microcontroller ?
- (c) What is the function of SMOD bit in TCON SFR ?
- (d) What is the function of GATE bit in TMOD SFR ?
- (e) Write the instruction to select register bank 2.

6. (a) Explain keyboard interfacing with 8051 and also draw a flow chart for detection and identification of key activation. 5
- (b) Describe the interfacing of 8051 with a DC motor and PWM. 5
7. (a) Explain timer flag interrupt, serial port interrupt and external interrupts with examples. 5
- (b) Explain byte level and bit level logical operations with examples. 5
8. (a) Explain the following with respect to 8051 microcontroller interrupt : 5
- (i) Priority level of various interrupts with their vector addresses.
- (ii) Explain with an example how their priority is altered.
- (b) Write short notes on the following SFRs :  $2 \times 2 \frac{1}{2} = 5$
- (i) TCON
- (ii) SCON

9. (a) Differentiate ADDC and SUB B instructions. List the precautions to be taken for both instructions during the program. 5
- (b) List the JUMP and CALL instructions. Describe conditional JUMP instruction. 5
10. (a) What is the function of a stack in 8051 ? Write an 8051 program to swap the contents of registers R7 and R6 in register bank 0. 5
- (b) What is the necessity of providing 4 banks of general purpose registers R0 to R7 in 8051 ? How do you switch over from bank 1 to bank 0 ? 5
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