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

Term-End Examination

00666

June, 2015

BIEE-010 : MICRO-CONTROLLERS

Time : 3 hours   *Maximum Marks : 70*

Note : *Attempt any **seven** questions. Assume missing data, if any suitably. Use of scientific calculator is permitted.*

1. (a) What are the advantages of a microcontroller over a microprocessor ? Give the applications of each.   5

    (b) What are the purposes of the following :
$$2\times2\frac{1}{2}=5$$

    (i) ALE signal

    (ii) Lock bits

2. (a) Explain the basic internal architecture of 8051 microcontroller.   5

    (b) Explain the Special Function Register PSW of 8051 and bring out the difference between CY and OV flags.   5

3. (a) What is meant by "Addressing Mode" ? How many addressing modes are there in 8051 ? Give one example of each type. *5*

(b) Explain the purpose of the following instructions : *5*

(i) NOP

(ii) DJNZ R7, ADDIT

(iii) ADDC A, Rn

(iv) MOV R0, # 50H

(v) MOV @ R0, A

4. (a) What is an interrupt ? Explain the different types of interrupts that 8051 can handle. *5*

(b) Two unpacked BCD digits are available in location 30H (most significant digit) and 31H (lowest significant digit). Write a program to pack these two and store in R7. *5*

5. (a) Find the biggest number in a block of data stored in the memory locations 70H –7FH and store the result in R1. *5*

(b) Write the interrupt priority word so that the following settings will be implemented in the 8051 :

The serial port interrupts and external interrupt 1 are high-priority interrupts; the other interrupts are low-priority ones. *5*

6. (a) Explain the Mode 0 operation of the 8051 timers. *4*

(b) Write a program to generate a square wave of frequency 2 kHz on any one of the port pins, using Timer 0, assuming that the clock frequency of 8051 system is 12 MHz. *6*

7. (a) How many types of serial communications are possible using 8051 ? *5*

(b) Write a program to transmit the ASCII character 'A' (41H) continuously using the 8051 serial port. Use 9-bit data at 9600 baud. Use polled operation. *5*

8. (a) State four instructions related with external memory of 8051. *4*

(b) Describe the difference between the Timer and Counter operation of 8051 microcontroller. *6*

9. (a) Explain the interfacing of ADC (0809) with the 8051. *4*

(b) Develop a program to convert the analog signal in channel 0 of ADC (0809) and store it in location 30H onwards. The routine should store the value whenever it is called. *6*

10. Write short notes on any *two* of the following : *2×5=10*

(a) Interfacing of 8051 to DAC

(b) RISC and CISC Architectures

(c) Assembler Directives

(d) Mode-3 of 8051 Timers