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DIPLOMA – VIEP – ELECTRONICS AND COMMUNICATION ENGINEERING (DECVI)/ ADVANCED LEVEL CERTIFICATE COURSE IN ELECTRONICS AND COMMUNICATION ENGINEERING (ACECVI)

Term-End Examination

December, 2015

BIEL-031 : MICROCONTROLLER

Time : 2 hours   *Maximum Marks : 70*

Note : Attempt any five questions. Question no. 1 is compulsory.

1. Choose the correct answer from the given four alternatives.   *7×2=14*

    (a)   The internal RAM memory of the 8051 is

        (i)   32 bytes

        (ii)   64 bytes

        (iii) 128 bytes

        (iv)   256 bytes

(b) The technique of assigning a memory address to each I/O device in the computer system is called

(i) peripheral mapped I/O

(ii) memory mapped I/O

(iii) ported I/O

(iv) dedicated I/O

(c) STACK in 8085 works in

(i) FIFO

(ii) LIFO

(iii) FILO

(iv) LILO

(d) Which one of the following has the highest priority among all the interrupts in 8086 ?

(i) NMI

(ii) DIV 0

(iii) TYPE 255

(iv) OVERFLOW

(e) The 8051 microcontroller can handle _____ interrupt sources.

(i) 3

(ii) 4

(iii) 5

(iv) 6

(f) With respect to MOVC bit instruction, MOV bit, C instruction in 8051 takes

(i) one cycle less

(ii) same cycles

(iii) one cycle more

(iv) None of these

(g) Which of the following signals is used to generate the read strobe for external program memory, interfaced with 8051 IC ?

(i) $\overline{RD}$

(ii) $\overline{PSEN}$

(iii) $\overline{EA}$

(iv) None of these

2. (a) What is the relation between Instruction cycle, Machine cycle, State and Pulse for any XX51 or 8051 microcontroller ?   7

(b) What are the major differences between 8051 ports and 8255 ports ? How are 8051 ports configured to function as input or output ?   7

3. (a) What is meant by 'Addressing Mode' ? How many addressing modes are there in 8051 ? Give one example of each type.   7

(b) Two unpacked BCD digits are available in locations 30H (MS digit) and 31H (LS digit). Write a program to pack these two and store in R7. 7

4. (a) In mode 1 of 8255 (PPI), what are the control signals when ports A and B act as output ports ? Discuss the control signals. Draw the timing waveform for such strobed output. 7

(b) Find the data direction and modes of operation of the 8255 ports, if the control word written into it is A0H. 7

5. (a) What are the essential features of 8155 ? Discuss the timer section of 8155 and its operating modes. 7

(b) What do you understand by assembler directives ? Explain the following directives with examples : 7

DB, ORG, EQU, END.

6. (a) How many types of serial communication are possible using 8051 ? What is the difference between mode 1 and mode 3 of serial communications ? 7

(b) Compare the two architectures, Harvard and Von Neumann, of microcontroller/microprocessor. 7

7. (a) Interface a set of 8 switches and 8 LEDs with the 8085 using an 8255 PPI chip. The 8255 should be selected for the following memory addresses :

Port A – 0740H, Port B – 0742H,

Port C – 0744H and CWR : 0746H

Write a program to indicate the status of the switches on LEDs. *10*

(b) Differentiate between the following Data Transfer Techniques : *4*

(i) Synchronous and Asynchronous

(ii) Polling and Interrupt driven

8. Write short notes on any *two* of the following : *2×7=14*

(a) Architecture of 8051

(b) Boolean Processor

(c) PSW SFR of 8051

(d) Interrupts of 8051

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