

Eng. Tech. College /Baghdad
Mechatronics Tech. Eng. Dept.
Academic Year 2017-2018
The Final Exam



Subject :Microcontroller & Microprocessor
Class: Third
Exam. Date: 6 / 6 / 2018
Allowed Time: 3 Hours

ملاحظة : الاجابة على جميع الاسئلة .

Q1/A/ Define the following (Answer Five only) (10 Marks)

- | | | |
|------------------|---------------------------------|----------------------|
| 1- DDRx register | 2- Code Segment register (8086) | 3- Address Bus |
| 4- Signed Number | 5- Instruction Register (AVR) | 6-Memory Access Time |

(5 Marks)

B/ A switch is connected to pin PB_0 and a LED to pin PB_7 , write a program to get the status of switch and send it to the LED.

Q2/A/ Explain the basic differences between the following (Answer Five only) (20 Marks)

- | | |
|--|---|
| 1- Timer ₁ vs. Timer ₂ . | 2- IJMP vs. RJMP instruction. |
| 3- 8Mhz vs. 16Mhz crystal . | 4-Harvard vs. Von-Nuemann architecture |
| 5- Simplex vs. Duplex . | 6- Interrupt Service Routine vs. Interrupt Vector Table |

(10 Marks)

B/ What does I₂C protocol mean ? Explain with drawing the physical I₂C bus and slave devices addressing and data transfer.

(20 Marks)

Q3/ Write an assembly program for the following (Answer Two only)

- 1- Write a program to transmit the message "YES" serially at (9600) baud rate , 8-bit data , and 1stop bit , do this forever .
- 2- Get the X value (0....9) from PORTB and send X² to PORTC , use lookup table method.

- 3- Generate a square wave of (16Khz) frequency with duty cycle (50%) on PORTB.3 using Timer₀ with normal mode and XTAL=8Mhz.

Q4/A/ Fill in the blanks for the following

(5 Marks)

- 1- The UBRR register contains the value with baud rate (2400) , XTAL = 8Mhz, U2X=0.
- 2- The instruction ANDI , is stand for
- 3- A Megabyte is bytes .
- 4- The assembly language is a level language.
- 5- The GPR's section of AVR RAM contains registers .

(10 Marks)

B/ What are the addressing modes , give a simple example for each one.

Q5/ Answer **Five** only from the following

(20 Marks)

- 1- What are the steps that are required for the CPU to respond to a subroutine program.
- 2- Illustrate the principle of operation of the ROL , LSR , SWAP , ASR instructions.
- 3- List the main advantages of EEPROM over UV-EPROM.
- 4- Write an assembly program to load the PORTB register with value (0x55) and then complement PORTB 700 times .
- 5- Explain the function of each flag bit of status register of (8086)microprocessor.
- 6- Draw the internal block diagram of (8086) microprocessor.



رئيس القسم

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مدرس المادة

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