

**Khalifa University of Science, Technology and Research**

**Electronics Engineering Department**

**Module Name: Microprocessor Systems Laboratory**

**Module Code: ELCE333**

**Pre-Laboratory Experiment No. 2**

**Microcontroller Assembly Program Development**

**Laboratory Partners**

Hamad Eisa Alhazami 100036985

Jasim Alhammadi 100035510

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**Laboratory Instructor:** Mr.Mohammed Alzaabi/ Mahmoud Khounji

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**1. List six of the Dragon12-Plus board features.**

1- On-board USB interface based on the flawless FT232RL for all Windows operating systems.

2- RS485 communication port with terminal block for daisy chaining.

3- USB interface selectable for both SCIs.

4- DPDT form C relay.

5- Light sensor for home automation applications.

6- Logic probe with LED indicator.

**2- Open the mc9s12dg256.inc under your includes directory and list the port address of the Ports B,J,P and H?**

**1-Ports B:**

Port B Register; 0x00000001

**2- Ports J:**

Port J I/O Register; 0x00000268

Port J Input Register; 0x00000269

Port J Data Direction Register; 0x0000026A

Port J Reduced Drive Register; 0x0000026B

Port J Pull Device Enable Register; 0x0000026C

Port J Polarity Select Register; 0x0000026D

Port J Interrupt Enable Register; 0x0000026E

Port J Interrupt Flag Register; 0x0000026F

**3- Ports P:**

Port P I/O Register; 0x00000258

Port P Input Register; 0x00000259

Port P Data Direction Register; 0x0000025A

Port P Reduced Drive Register; 0x0000025B

Port P Pull Device Enable Register; 0x0000025C

Port P Polarity Select Register; 0x0000025D

Port P Interrupt Enable Register; 0x0000025E

Port P Interrupt Flag Register; 0x0000025F’

**4- Ports H:**

Port H I/O Register; 0x00000260

Port H Input Register; 0x00000261

Port H Data Direction Register; 0x00000262

Port H Reduced Drive Register; 0x00000263

Port H Pull Device Enable Register; 0x00000264

Port H Polarity Select Register; 0x00000265

Port H Interrupt Enable Register; 0x00000266

Port H Interrupt Flag Register; 0x00000267

**3- Consider the code given below, how many cycles (single step execution) will it take to execute this program? How long will this take on the Dragon Plus Trainer board?**

; Include derivative-specific definitions

INCLUDE 'derivative.inc'

; export symbols

XDEF Entry

Entry:

ldab #100

loop1: ldx #10000

loop2: dex

bne loop2

decb

bne loop1

As shown below, it will take **4000401** cycles to be executed in the program and on the Dragon Plus Trainer Board.

