

Microprocessor Based Systems. Test of January 12, 2011.

Let us assume to have two arrays of 8-bit signed (2's complement) integer values (in little endian) denoted as

```
A  DB  6 DUP(?)  
B  DB  6 DUP(?)
```

It is required to write an 8086 assembly program that:

1. computes the result coming from the multiplication of the 6 values of each array, and store them into two additional arrays (in two's complement)

```
MULT_A  DB  6 DUP(?)  
MULT_B  DB  6 DUP(?)
```

respectively, (in the running version to be presented at oral exam these results have to be displayed on the screen);

2. determines which one between MULT_A and MULT_B is the largest value;
3. determines which one between MULT_A and MULT_B has the largest absolute value.

Assume that final results to be stored in MULT_A and MULT_B do not exceed the 48 bits of length.

Evaluation:

Item 1. = up to 24 points;

Item 2. = up to 4 points;

Item 3. = up to 4 points;

Hints.

Do not forget that negative numbers in two's complement can be seen as the "splitting" of one negative and one positive number. For example: 110101 = 110000 + 000101 (i.e. the first is a negative number while the second is positive).

Intermediate/internal changes of representation (pure binary, module and sign, ...) are possible and are encouraged especially if leading to a simple and more readable and testable algorithm.

It is not required to provide the optimal (shortest, most efficient, fastest, ...) solution, but a working and clear solution.

Please use carbon copy and retain one copy for home implementation and debug. Please provide your classroom submitted solution with several explanatory and significant comments. When coming to oral discussion, please mark on your "classroom" copy all modifications. Please also provide an error-free and running release of the solution, as well as with its printed list of instructions. Please consider that the above are necessary but not sufficient requirements to success the exam, since the final evaluation will be based on a number of parameters.

FAILURE TO ACCOMPLISH ALL PREVIOUS NECESSARY REQUIREMENTS WILL CAUSE NO-QUESTION-ASKED AND IMMEDIATE REJECTION.