Problem 1 (40 points: Each question 5 points)

Q.1
Consider the following:
\[
\text{Var1 BYTE 15 DUP(2, 3, 5 DUP(11, 12))}
\]
This statement will:
A. Allocate 150 bytes in memory
B. Allocate 180 bytes in memory
C. Allocate 75 bytes in memory

Q2, 3 and 4
Consider the following:
```
.data
    Var1 BYTE 12h, 13h, 14h, 15h, 16h, 17h, 18h, 19h
    Var2 LABEL WORD
    Var3 LABEL DWORD
    Num EQU 5
    Var4 BYTE 22h, 23h, 24h, 25h, 26h, 27h, 28h, 29h
```

Q.2
What is the value contained in AX after the execution of the following statement:
```
MOV AX, OFFSET Var3
```
A. 0008h
B. 000Ah
C. 0001h

Q.3
What is the value of register BX after the execution of the following instruction:
```
MOV BX, Var2+6
```
A. 2726h
B. 2827h
C. 2928h
Q.4
What is the value of register EBX after the execution of the following instruction?

\[\text{MOV} \hspace{1em} \text{EBX, Var3}\]

A. 29282726h
B. 25242322h
C. 27262524h

Q5, 6, 7 and 8
Consider the following:

.data
  Var1 BYTE 0Ch, 0Dh, 0Eh, 0Fh
  Var2 WORD 0Ch, 0Dh, 0Eh, 0Fh
  Var3 DWORD 0Ch, 0Dh, 0Eh, 0Fh
  Msg  BYTE 'Virtually'

Q.5
Compute the address that should be used to access the letter ‘V’ in the word ‘Virtually’

Q.6
Compute the address that should be used to access the second ‘l’ of the word ‘Virtually’.

Q.7
What is the value of the register AX after the execution of the following instruction:

\[\text{MOV} \hspace{1em} \text{AX, Var2+2}\]

A. 000Ch
B. 0C0Dh
C. 000Dh

Q.8
What is the value of the register EAX after the execution of the following instruction:

\[\text{MOV} \hspace{1em} \text{AX, TYPE Var3}\]

A. 2
B. 4
C. 8
Problem 2 (40 points)
Consider the following:

.data
    Table1 BYTE 8, 10h, 9, 20h, 10, 23h, F6h, 22h, 16h
    NumE  EQU LENGTHOF Table1
    Array  DWORD 01h, 02h, 03h, 04h

1. Consider the following statement: (10 points)

    MOV EAX, NumE

    The addressing mode of operand NumE is:
    A. Direct
    B. Immediate
    C. Register

    Justify your answer:

2. Consider the following statement: (10 points)

    MOV NumE, EBX

    Is this a correct statement?
    A. Yes.
    B. No.

    Justify your answer.

3. Consider the following statement: (10 points)

    MOV EAX, Table1 + LENGTHOF Table1
    is equivalent to:
    MOV EAX Array

    Is this correct?
    A. Yes.
    B. No.

    Justify your answer.

4. We want to move the second word in the double word “Array” to the register BX. Write the statement that will achieve that. (10 points)
**Problem 4 (20 points)**

Consider the following data allocation statements:

```
.data
  Var1  BYTE 0Ch, 0Dh, 0Eh, 0Fh
  Var2  WORD 0Dh, 0Eh, 0Fh, 0Ah
  Var3  DWORD 0Eh, 0Fh, 0Ah, 0Bh
  Var4  LABEL WORD
  Var5  LABEL DWORD
  Msg  BYTE 'Virtually'
  Table1 BYTE 5 DUP(27,35h)
```

Please fill the content of the following table to show the effect of the statements above.

<table>
<thead>
<tr>
<th>Label</th>
<th>Address</th>
<th>Data</th>
<th>Label</th>
<th>Address</th>
<th>Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>0000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0018</td>
</tr>
<tr>
<td>0001</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0019</td>
</tr>
<tr>
<td>0002</td>
<td></td>
<td></td>
<td>0003</td>
<td>0018</td>
<td>001A</td>
</tr>
<tr>
<td>0004</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>001B</td>
</tr>
<tr>
<td>0005</td>
<td></td>
<td></td>
<td>0006</td>
<td>001A</td>
<td>001C</td>
</tr>
<tr>
<td>0007</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>001D</td>
</tr>
<tr>
<td>0008</td>
<td></td>
<td></td>
<td>0009</td>
<td>001D</td>
<td>001E</td>
</tr>
<tr>
<td>0009</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>001F</td>
</tr>
<tr>
<td>000A</td>
<td></td>
<td></td>
<td></td>
<td>0020</td>
<td>001F</td>
</tr>
<tr>
<td>000B</td>
<td></td>
<td></td>
<td></td>
<td>0021</td>
<td>0020</td>
</tr>
<tr>
<td>000C</td>
<td></td>
<td></td>
<td></td>
<td>0021</td>
<td>0021</td>
</tr>
<tr>
<td>000D</td>
<td></td>
<td></td>
<td></td>
<td>0022</td>
<td>0022</td>
</tr>
<tr>
<td>000E</td>
<td></td>
<td></td>
<td></td>
<td>0023</td>
<td>0023</td>
</tr>
<tr>
<td>000F</td>
<td></td>
<td></td>
<td></td>
<td>0024</td>
<td>0024</td>
</tr>
<tr>
<td>0010</td>
<td></td>
<td></td>
<td></td>
<td>0025</td>
<td>0025</td>
</tr>
<tr>
<td>0011</td>
<td></td>
<td></td>
<td></td>
<td>0026</td>
<td>0026</td>
</tr>
<tr>
<td>0012</td>
<td></td>
<td></td>
<td></td>
<td>0027</td>
<td>0027</td>
</tr>
<tr>
<td>0013</td>
<td></td>
<td></td>
<td></td>
<td>0028</td>
<td>0028</td>
</tr>
<tr>
<td>0014</td>
<td></td>
<td></td>
<td></td>
<td>0029</td>
<td>0029</td>
</tr>
<tr>
<td>0015</td>
<td></td>
<td></td>
<td></td>
<td>002A</td>
<td>002A</td>
</tr>
<tr>
<td>0016</td>
<td></td>
<td></td>
<td></td>
<td>002B</td>
<td>002B</td>
</tr>
<tr>
<td>0017</td>
<td></td>
<td></td>
<td></td>
<td>002C</td>
<td>002C</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>002D</td>
<td>002D</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>002E</td>
<td>002E</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>002F</td>
<td>002F</td>
</tr>
</tbody>
</table>