Homework #1 Answer Key

Problem 1)
Identify the operand addressing mode used in each of these instructions.

a) MOV DX,[DI] Indexed
b) MOV AX,TABLE[BX] Based+Displacement or Register Indirect
c) MOV CX,27H Immediate
d) MOV ARRAY[SI][BX],BP Based+Indexed+Displacement
e) MOV [BP],BX Based
f) MOV BL,AL Register
g) MOV VAR,AX Direct

Problem 2)
Refer to this code fragment to answer the following questions:

```
_data segment public word ‘data’
stuff dw 4 dup (?)
var1 dw 0
var2 dw 1
var3 dw 23Fh
inx dw ?
string db ‘ABCD’
array db 0,1,2,3,4,5,6,7
   db 8,9,10,11,12,13,14,15
_data ends

_text segment public word ‘code’
mov ax,seg _data
mov ds,ax
mov ax,var2 ;question a
mov bx,ax
mov al,string[bx] ;question b, c
mov cx,1122h ;question d
mov dl,cl
mov dh,ah
mov var1,dx ;question e, f
mov ah,dl
mov array[8],ax
lea si,array[bx+2] ;question g
mov al,[si] ;question h
_text ends
```

;---------------------------------
Answer the following questions. The comments on the above lines note which line of code pertains to each question:

a) What is the value in AX after this instruction? 0001h
b) What is the value of AX after this instruction? 0042h
c) What is the effective address (offset) used for the memory address in this instruction? 0011h
d) What value will be in CH after this instruction? 11h
e) What value will be stored into memory by this instruction? 0022h
f) What is the effective address (offset) used for the memory address in this instruction? 0008h
g) What is the value in SI after this instruction? 0017h
h) What is the value in AX after this instruction? 2203h

Problem 3)
Refer to the above fragment of code again. The name ‘array’ is associated with a memory array containing 16 bytes. Construct a table showing the offset and value of each byte of the array before/after the execution of the above code. (Note: The offset of the first location in the ‘_data’ segment will be 0h.)

<table>
<thead>
<tr>
<th>Offset</th>
<th>Before</th>
<th>After</th>
</tr>
</thead>
<tbody>
<tr>
<td>23h</td>
<td>0Fh</td>
<td>0Fh</td>
</tr>
<tr>
<td>22h</td>
<td>0Eh</td>
<td>0Eh</td>
</tr>
<tr>
<td>21h</td>
<td>0Dh</td>
<td>0Dh</td>
</tr>
<tr>
<td>20h</td>
<td>0Ch</td>
<td>0Ch</td>
</tr>
<tr>
<td>1Fh</td>
<td>0Bh</td>
<td>0Bh</td>
</tr>
<tr>
<td>1Eh</td>
<td>0Ah</td>
<td>0Ah</td>
</tr>
<tr>
<td>1Dh</td>
<td>09h</td>
<td>22h</td>
</tr>
<tr>
<td>1Ch</td>
<td>08h</td>
<td>42h</td>
</tr>
<tr>
<td>1Bh</td>
<td>07h</td>
<td>07h</td>
</tr>
<tr>
<td>1Ah</td>
<td>06h</td>
<td>06h</td>
</tr>
<tr>
<td>19h</td>
<td>05h</td>
<td>05h</td>
</tr>
<tr>
<td>18h</td>
<td>04h</td>
<td>04h</td>
</tr>
<tr>
<td>17h</td>
<td>03h</td>
<td>03h</td>
</tr>
<tr>
<td>16h</td>
<td>02h</td>
<td>02h</td>
</tr>
<tr>
<td>15h</td>
<td>01h</td>
<td>01h</td>
</tr>
<tr>
<td>14h</td>
<td>00h</td>
<td>00h</td>
</tr>
</tbody>
</table>