

BTI Exam, version 1

1. Fundamentals (10 pts.)

A. Determine the validity of the following commands:

Instruction	Valid (Yes/No)
MOV CX,DL	Nu
MOV [BX+34h], DI	Da
POP [1234h]	Da
MOV [SI],[DI]	Nu

B. Considering the following values of the registers, please complete the indicated values.

AX=2341 BX=EDF3 CX=0015 DX=0291

DH = 02 AH = 23 BL = F3 CL = 15

C. Calculate the linear address segment:offset. Write the result in hexadecimal.

Segment:offset	Linear address
03A2:0C32	04652
F325:0AB3	F3D03

2. Arithmetic and logical instructions (32 pts.)

A. Calculate the final values of the registers. All values are in hexadecimal.

AX=CC2D BX=5452 CX=0003 DX=0224

ADD AL, DL
SUB BX, CX
SHL AX, CL

AX = 6288 BX = 544F

B. Calculate the final values of the registers. All values are in hexadecimal.

AX=1280 BX=0010 CX=C3E0 DX=0100

XOR CX, CX
NOT BX
OR BX, DX

AX = 1280 BX = FFEF CX = 0000

C. Calculate the final values of the registers. All values are in hexadecimal.

AX=0005 BX=00A1 CX=00A1

```
MUL BL
MOV BX,AX
DEC CL
SHR AX,1
```

AX = **0192** BX = **0325** CX = **00A0**

3. Stack operations (28 pts.)

A. Calculate the final values of the registers. All values are in hexadecimal.

AX=0ECE DI=0291 SI=4209

```
PUSH AX
MOV AX, SI
POP SI
PUSH AX
ADD AX, SI
POP DI
```

AX = **50D7** DI = **4209** SI = **0ECE**

B. Calculate the final values of the registers. All values are in hexadecimal.

AX=0A82 BX=2618 CX=2261 DX=8226

```
PUSH AX
MOV AX, DX
SUB AL, BL
PUSH AX
POP CX
POP BX
```

BX = **0A82** CX = **820E**

C. Calculate the final values of the registers. All values are in hexadecimal.

DI=0765 SI=0505 BX=0B00 CX=0A02

```
PUSH DI
PUSH BX
PUSH SI
MOV BP, SP
MOV CX, [BP+2]
ADD SP, 4
```

POP SI

CX = **0B00** SI = **0765**

4. Memory operations (20 pts.)

A. In the following table, complete the content of the data segment in memory corresponding to the following variable declarations. For the memory content whose value cannot be determined, complete the table using the * character.

; start of the data segment

var1 DW 1234h
var2 DW ABCDh
aleg DB 3 DUP(?)
mesaj DB 'Hello',0
vector DB 98h,76h,54h

Obs. We are considering
memory representation of data
for INTEL Pentium
microprocessor

Offset	Data
0000	34
0001	12
0002	CD
0003	AB
0004	*
0005	*
0006	*
0007	„H”
0008	„e”
0009	„l”
000A	„l”
000B	„o”
000C	„0”
000D	98
000E	76
000F	54

B. Considering the following memory content, determine the values of the registers after the execution of each instruction.

DS:0000	12	23	43	89	47	58	09	28
DS:0008	AF	D8	9C	2E	FF	00	90	BD
DS:0010	82	40	1F	C8	C4	EE	38	21
DS:0018	03	00	05	00	02	00	08	00

MOV AX, [18h] AX=0003

MOV DL, [18h] DL= 03

MOV BL, [AX] BL= 89

MOV BH, [AX+3] BH= 09

MOV SI, [1Ch] SI= 0002

5. Jump instructions (10 pts.)

Given the values of the registers, determine the result of each jump instruction. It is assumed that each set of 2 instructions is executed independently.

AX=1013 BX=A083 CX=FFFF DX=0013

CMP CX, DX

JA nume_eticheta ; the jump is made

CMP CX, DX

JG nume_eticheta ; the jump is NOT made

INC CX

JZ nume_eticheta ; the jump is made

XOR BX, BX

JE nume_eticheta ; the jump is made

CMP AL, DL

JNG nume_eticheta ; the jump is made