(5) Question 1. Answer A,B,C,D,E	**A)** nonvolatile
(5) Question 2. Answer $00 to $FF	171=16*10+11=**$AB**
(4) Part 3a. Specify **RegB**	101-110 = -9 which is –9+256 = **247**
(2) Part 3b. Specify **0 or 1**	**C=1** because –9 is out of range
(2) Part 3c. Specify **0 or 1**	**V=0** because –9 is in range
(2) Part 3d. Specify **0 or 1**	**Z=0** because the result is not zero
(2) Part 3e. Specify **0 or 1**	**N=1** because the result is negative
(10) Question 4. Specify D	D = **0.001**
(10) Question 5. Show the machine code	convert 20 to 9-bit binary 0,0001,0100, 16+4 complement 1,1110,1011, then add one to get -20 in 9-bit binary 1,1110,1100 op code is $EA, xb byte 9-bit Y index is $E9, (negative) ff byte is $EC altogether **$EA E9 EC**
(10) Question 6. What value is pushed	address of next instruction is **$F126**

(10) Question 7. Simplified memory cycles

R/W	Addr	Data	changes (memory, RegY not changed)
1	$F129	$EA	IR=$EA, PC=$F12A
1	$F12A	$4A	EAR=$098A, PC=$F12B
1	$098A	$8A	RegB=$8A

(40) Question 8. Write the assembly language program that implements a thermostat.

```
        org  $f000
main    movb #$FF,DDRB  output is heater
        movb #0,DDRA    input is temperature sensor
loop    ldaa PORTA      check temperature
        cmpa #2*68      too cold?
        bhs  notCold
        movb #$FF,PORTB turn on heater
notCold cmpa #2*72      too hot?
        bls  notHot
        movb #$00,PORTB turn off heater
notHot  bra  loop
        org  $fffe
        fdb  main
```