What skill do I have to master to make my life great?

1. Dress well.
2. Speak clear and confident.
3. Life purpose.
4. Respect.
5. Well manner.
6. Smile.
7. Speak truth.
8. Accepting situation.
9. Optimistic thinking.
10. Self belief's.
11. Education.
12. Good knowledge of any particular field.
13. Observation.
14. Self love.
15. Gratitude.
16. Broad mindset.
17. Take care Health.
18. Managing wealth.
19. Making true friends.
20. Handling failure and heartbreak.

ARM Processor-Test1-Key Answers

1. Justify the following

(i) ARM is suitable for Embedded System applications

(ii) Code density will be improved using Thumb Instructions

Ans: (i) The following features that make ARM ideal for embedded applications

- Small processor for lower power consumption
- High code density for limited memory and physical size restrictions
- Can interface with slow and low-cost memory systems
- Reduced die size for processor to accommodate more peripherals

(ii)

ARM code	Thumb code
ARMDivide	ThumbDivide
; IN: r0(value),r1(divisor)	; IN: r0(value),r1(divisor)
; OUT: r2(MODulus),r3(DIVide)	; OUT: r2(MODulus),r3(DIVide)
MOV r3,#0	MOV r3,#0
loop	loop
SUBS r0,r0,r1	ADD r3,#1
ADDGE r3,r3,#1	SUB r0,r1
BGE loop	BGE loop
ADD r2,r0,r1	SUB r3,#1
	ADD r2,r0,r1
$5 \times 4 = 20$ bytes	$6 \times 2 = 12$ bytes

The above table indicates that

- A thumb implementation of the same code takes up around 30% less memory than the equivalent ARM implementation
- Uses 70% of the space of the ARM code and uses 40% more instructions than the ARM

2. Use the suitable single ARM instruction to perform the followingoperations

(i) R0 = ~ R1
(ii) R3 = R2 + R2 X 8
(iii) R6 = R5 – R4 / 16
(iv) R10 = R9 X R8 + R7
(v) R12 = R11 + 12 if Z =1

Ans: (i) MVN R0,R1
(ii) ADD R3,R2,R2,LSL#3
(iii) SUB R6,R5,R4,LSR#4
(iv) MLA R10,R9,R8,R7
(v) ADDEQ R12,R11,#12

3. Compute the following

i) Effective address of the instruction
STR R0, [R1], # -12 if register R1=0x200

ii) The value of SP after executing the instruction
STMFD SP!, {R0, R1} if SP is 0x10001000 initially

iii) The value in register R8 after execution of the instruction
RSB R8,R4,R5 If R4 = 15 and R5 = 20

iv) The value in register R2 after execution of the instruction
MOVT R2,#0x1234

v) The value in register R2 after executing the instruction
EOR R2, #0xf<<0 If R2 = 0x1234 initially

Ans: (i) R1 – 12 = 0x200 – 12 = 0x1F4

(ii) 2 registers * 4 bytes each = 8 bytes (0x08)
SP=0x10001000 – 0x08 = 0x10000FF8

(iii) R8 = R5 – R4 →R8 = 20 – 15 = 05

(iv) R2 = 0x12340000

(v) R2 =0x123B

Develop an ARM ALP to

i) Transfer the five 32-bit numbers defined in the code memory to descending stack memory

ii) Generate Table 5 in read-write memory

Ans: (i)

```
      area reset,data,readonly
      export __Vectors
__Vectors
            dcd 0x10001000; initilization of stack memory
            dcd Reset_Handler

      area mycode,code,readonly
                  entry
                  export Reset_Handler

Reset_Handler
                              ldr r0,=src

                              ldmia r0,{r1-r5}
                              stmfd sp!, {r1-r5}

stop b stop
src dcd  0x12345678, 0xabcdef01, 0x87654321, 0x1379ace1,0x98765432
        end
```

(ii)

```
area reset,data,readonly
            export __Vectors
__Vectors
            dcd 0
            dcd Reset_Handler

 area mycode,code,readonly
 entry
 export Reset_Handler
Reset_Handler

            mov r0,#10
            ldr r1,=data1
            mov r2,#5

cont       strb r2,[r1],#1
            add r2,r2,#5
            subs r0,r0,#1
            cmp r0,#0
            bne cont

stop b stop

 area mydata,data,readwrite
data1 space 0
  end
```