

ASSUMING A = 0X1234, B = 0X1234, AND C = 0, WHAT IS THE VALUE OF C AFTER EXECUTING THE FOLLOWING CODE?

```
LDR R0, =A
LDR R1, [R0]
LDR R0, =B
LDRH R2, [R0]
LDR R5, =C
CMP R1, R2
BNE ELSE_LABEL
LDR R3, =0X2222
B STORE_C
ELSE_LABEL
LDR R3, =0X1111
STORE_C
STR R3, [R5]
```

- A) This code will not be assembled
- B) 0x1111
- C) 0x2222
- D) 0
- E) None of the answers

ANSWER: C

ASSUMING SP = 0X20000408, WHAT IS THE VALUE OF SP AFTER THE INSTRUCTION PUSH {R0-R2}?

- A) 0x200003FC
- B) 0x20000404
- C) 0x20000400
- D) 0x20000203
- E) None of answers

ANSWER: A

ASSUMING THE TOP 3 VALUES OF THE STACK IN ORDER ARE 4, 3, AND 5 WHAT IS THE VALUE OF REGISTER R0 AFTER THE INSTRUCTION POP {R0-R2}?

- A) 3
- B) 4
- C) 5
- D) None of the answers

ANSWER: B

FROM THE BELOW PROGRAM, WHAT ARE THE VALUES OF R4, R5, AND R7 AFTER THE EXECUTION OF THE PROGRAM?

```
MOV R4, #7
MOV R5, #3
MOV R6, #3
AGAIN MOV R7, R4
ADD R4, R5, R4
MOV R5, R7
SUBS R6, R6, #1
BNE AGAIN
```

- A) R4=0x1B, R5=0x11, R7=0x11
- B) R4=0x04, R5=0x04, R7=0x03
- C) R4=0x03, R5=0x03, R7=0x03
- D) R4=0x04, R5=0x03, R7=0x02
- E) None of the answers

ANSWER: A

ASSUMING WE WANT TO LOAD 2 BYTES FROM THE ADDRESS STORED IN R1 INTO R0, WHICH INSTRUCTION TO USE?

- A) LDRH R0, [R1]
- B) LDR R0, [R1]
- C) LDRB R0, [R1]
- D) LDR R0, =R1
- E) None of the answers

ANSWER: A

WHAT IS CONTENTS OF R1 IN THE BELOW INSTRUCTION? ASSUME R2= 0X00001234.

MOV R1, R2, LSL #4

A) R1= 0x00012340

B) R1 = 0x00000123

C) R1= 0x00123400

D) None of the other answers.

ANSWER: A

ASSUMING A = 0X1234, B = 0X1234, AND C = 0, WHAT IS THE VALUE OF C AFTER EXECUTING THE FOLLOWING CODE?

LDR R0, =A

LDR R1, [R0]

LDR R0, =B

LDRB R2, [R0]

LDR R5, =C

CMP R1, R2

BNE ELSE_LABEL

LDR R3, =0X2222

B STORE_C

ELSE_LABEL LDR R3, =0X1111

STORE_C STR R3, [R5]

A) This code will not be assembled

B) 0x1111

C) 0x2222

D) None of the answers

ANSWER: B

ASSUMING THE TOP 3 VALUES OF THE STACK IN ORDER ARE 5,4, AND 3 WHAT IS THE VALUE OF REGISTER R0 AFTER THE INSTRUCTION POP {R0-R2}?

A) 5

B) 4

C) 3

D) None of the answers

ANSWER: A

FROM THE BELOW PROGRAM, WHAT ARE THE VALUES OF R4, R5, AND R7 AFTER THE EXECUTION OF THE PROGRAM?

```
MOV R4, #7
```

```
MOV R5, #5
```

```
MOV R6, #5
```

```
AGAIN MOV R7, R4
```

```
ADD R4, R5, R4
```

```
MOV R5, R7
```

```
SUBS R6, R6, #1
```

```
BNE AGAIN
```

A) R4=0x04, R5=0x03, R7=0x03

B) R4=0x51, R5=0x32, R7=0x32

C) R4=0x04, R5=0x04, R7=0x03

D) R4=0x03, R5=0x03, R7=0x03

E) None of the answers

ANSWER: B

BIG ENDIAN BYTE ORDER is the MOST SIGNIFICANT byte (the "big end") of the data is placed at the byte with the lowest address. The rest of the data is placed in order in the next three bytes in memory.

EXAMPLE: A variable X with value 0x01234567 will be stored in address 0x100 as

@addr-->value

0x100 --> 0x01

0x101 --> 0x23

0x102 --> 0x45

0x103--> 0x67

Based on what explained above, trace following instructions, assume list start at memory location 0x0000018 and using ARM Big Endian. What is the result of R0 AND R2 after execution?

```
LDR R0, =LIST
```

```
MOV R10, #0X2
```

```
LDR R2, [R0, #4]!
```

```
AREA READ_variables, DATA, READONLY
```

```
LIST DCB 0X34, 0XF5, 0X32, 0XE5, 0X01, 0X02, 0X8, 0XFE
```

A) R0= 0x18 and R2= 0x010208FE

B) R0= 0x1C and R2= 0x010208FE

C) R0= 0x18 and R2= 0xFE080201

D) R0= 0x1C and R2= 0xFE080201

E) None of the answers

F) R0= 0x1C and R2= 0x34F532E5

G) R0= 0x18 and R2= 0x34F532E5

ANSWER: B

BIG ENDIAN BYTE ORDER is the MOST SIGNIFICANT byte (the "big end") of the data is placed at the byte with the lowest address. The rest of the data is placed in order in the next three bytes in memory.

EXAMPLE: A variable X with value 0x01234567 will be stored in address 0x100 as

@addr-->value

0x100 --> 0x01

0x101 --> 0x23

0x102 --> 0x45

0x103--> 0x67

Based on what explained above, trace following instructions, assume list start at memory location 0x0000018 and using ARM Big Endian.

What is the result of R0 AND R5 after execution?

```
LDR R0, =LIST
```

```
MOV R10, #0X2
```

```
LDRB R5, [R0], #1
```

```
AREA READ_variables, DATA, READONLY
```

```
LIST DCB 0X34, 0XF5, 0X32, 0XE5, 0X01, 0X02, 0X8, 0XFE
```

A) R0= 0x19, R5=0x34

B) R0= 0x18, R5=0x34

C) R0= 0x19, R5=0x34F532E5

D) R0= 0x19, R5=0xE532F534

E) R0= 0x18, R5=0x34F532E5

F) None of the answers

ANSWER: A

BIG ENDIAN BYTE ORDER is the MOST SIGNIFICANT byte (the "big end") of the data is placed at the byte with the lowest address. The rest of the data is placed in order in the next three bytes in memory.

EXAMPLE: A variable X with value 0x01234567 will be stored in address 0x100 as

@addr-->value

0x100 --> 0x01

0x101 --> 0x23

0x102 --> 0x45

0x103--> 0x67

Based on what explained above, trace following instructions, assume list start at memory location 0x0000018 and using ARM Big Endian. What is the result of R1 after execution?

```
LDR R0, =LIST
```

```
MOV R10, #0X2
```

```
LDR R1, [R0]
```

```
AREA READ_variables, DATA, READONLY
```

```
LIST DCB 0X34, 0XF5, 0X32, 0XE5, 0X01, 0X02, 0X8, 0XFE
```

A) R1=0x34F532E5

B) R1=0x010208FE

C) R1= 0xE532F534

D) None of the above

E) $R1=0 \times 34$

ANSWER: A

GIVEN AN INTEGER VARIABLE A. HOW TO CLEAR BIT 2 OF VARIABLE A IN C? THE REMAINING BITS SHOULD BE UNMODIFIED.

A) $a|=1<<2;$

B) $a\&=1<<2;$

C) $a\&=\sim(1<<2);$

D) $a|=\sim(1<<2);$

E) None of the answers

ANSWER: C

GIVEN AN INTEGER VARIABLE A. HOW TO SET BIT 2 OF VARIABLE A IN C? THE REMAINING BITS SHOULD BE UNMODIFIED.

A) $a|=1<<2;$

B) $a|=1<<3;$

C) $a|=1>>2;$

D) $a|=1>>3;$

E) None of the answers

ANSWER: A

HOW MANY REGISTERS DO THE ARM CORTEX-M PROCESSORS HAVE?

A) 16

B) 13

C) 15

D) None of the other answers

ANSWER: A

IN ARM CORTEX M4, WHAT IS THE ROLE OF R15?

A) Program Counter

B) Link Register

C) Stack Pointer

D) Condition Bits Register

E) None of the answers

ANSWER: A

WHAT DOES HAPPEN WHEN RESET IS EXECUTED IN ARM-CORTEX M BASED MICROCONTROLLER?

A) The 32-bit value stored at location 0 of flash ROM is loaded into the PC and the 32-bit value stored at location 4 of flash ROM is loaded into SP and LR register value is set to 0xFFFFFFFF.

B) The 32-bit value stored at location 0 of flash ROM is loaded into the SP and the 32-bit value stored at location 4 of flash ROM is loaded into PC and LR register value is set to 0xFFFFFFFF0.

C) The 32-bit value stored at location 0 of flash ROM is loaded into the SP and the 32-bit value stored at location 4 of flash ROM is loaded into PC and LR register value is set to 0xFFFFFFFF.

D) None of the answers

ANSWER: C

WHAT IS CONTENTS OF R1 IN THE BELOW INSTRUCTION? ASSUME R1= 0x80008001. LSR R1,R1,#3

A) 0x10001000

B) 0x00080010

C) 0xC0004000

D) None of the answers

ANSWER: A

WHAT IS THE ADDRESSING MODE OF THE INSTRUCTION LDR R0, [R1]?

A) Indexed Addressing

B) Immediate Addressing

C) PC-relative Addressing

D) Direct Addressing

E) None of the answers

ANSWER: A

WHAT IS THE FUNCTIONALITY OF BELOW CODE? WHAT IS THE FINAL RESULT OF R0 AND R1 IF THE INITIAL VALUE OF R0 IS 9 AND THE INITIAL VALUE OF R1 IS 6?


```

LOOP    CMP R0, R1

        BEQ END

        BLT LESS

        SUB R0, R0, R1

        B Loop

LESS    SUB R1, R1, R0

        B LOOP

        END

```

- A) Greatest Common Divisor, R0=3 , R1= 3
- B) Highest Common Factor, R0=6, R1=6
- C) Calculating logarithm of a number to base 2, R0=3, R1=3
- D) Least common Multiple, R0=9, R1=18
- E) None of the answers

ANSWER: A

WHAT IS THE PURPOSE OF THE C FLAG IN THE PSR OF CORTEX-M PROCESSORS?

- A) The C flag is set in case of an unsigned overflow
- B) The C flag is set if the result of the operation is less than zero
- C) The C flag is set if the result of the operation is zero
- D) None of the other answers

ANSWER: A

WHAT IS THE VALUE OF R0 AND R1 AT THE END OF THE PROGRAM?

```

        AREA WRITE_VARIABLES, DATA, READWRITE

Z DCD 0

        AREA MYCODE, CODE, READONLY

        LDR R4, =A

        LDR R0, [R4]

        LSL R0, R0, #2

        LDR R4, =B

        LDR R1, [R4]

```

```
AND R1, R1, #15
ORR R1, R0, R1
LDR R4, =Z
STR R1, [R4]
B END_LOCA
DCD 1B
DCD 18
END_LOC NOP
```

- A) 4, 6
- B) 3, 5
- C) 3, 6
- D) 2, 5
- E) None of the answers

ANSWER: A

WHICH INSTRUCTION WILL BE USED? ASSUME WE WANT TO MOVE AN IMMEDIATE 32-BIT NUMBER (0X22222222) INTO R1.

- A) LDR R1, =0x22222222
- B) LDR R1, #0x22222222
- C) MOV R1, =0x22222222
- D) None of the other answers

ANSWER: A

WHICH OF THE FOLLOWING IS WORD-ALIGNED ADDRESS?

- A) 0x80000008
- B) 0x80000001
- C) 0x80000003

ANSWER: A

WHICH OPERATION IS USED TO CLEAR THE VALUE OF BITS?

- A) AND
- B) EOR

C) OR

D) BIC

E) None of the answers

ANSWER: A

WHICH OPERATION IS USED TO TOGGLE THE VALUE OF BITS?

A) EOR

B) ORR

C) AND

D) BIC

E) None of the answers

ANSWER: A