



# ARM

EN0-001 Exam

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Question: 1

In a Cortex-A9 processor, when the Memory Management Unit (MMU) is disabled, which of the following statements is TRUE? (VA is the virtual address and PA is the physical address)

- A. VA == PA; No address translations; instructions and data are not cached
- B. VA != PA; No address translations; instructions may be cached but not data
- C. VA == PA; Address translations take place; data may be cached but not instructions
- D. VA == PA; No address translations; instructions may be cached but not data

Answer: D

Question: 2

In the Generic Interrupt Controller (GIC), when an interrupt is requested, but is not yet being handled, it is in which of the following states?

- A. Inactive
- B. Active
- C. Pending
- D. Edge-triggered

Answer: C

Question: 3

A simple system comprises of the following memory map:

Flash - 0x0 to 0x7FFF

RAM - 0x10000 to 0x17FFF

When conforming to the ABI, which of the following is a suitable initial value for the stack pointer?

- A. Top address of RAM (0x18000)
- B. Top address of flash (0x8000)
- C. Bottom address of RAM (0x10000)
- D. Bottom address of flash (0x0000)

Answer: A

Question: 4

A program running on a development board that is connected to a host using a debugger can access a file on the host by using:

- A. Memory mapping
- B. Semihosting
- C. Polling
- D. Virtual I/O

Answer: B

Question: 5

In which type of storage will the compiler preferentially place frequently accessed variables?

- A. Stack
- B. Heap
- C. Registers
- D. Hard disk

Answer: C

Question: 6

What view in a debugger displays the order in which functions were called?

- A. The Call Stack view
- B. The Memory view
- C. The Registers view
- D. The Variables view

Answer: A

Question: 7

Printf statements could be used to achieve which of the following debug tasks?

- A. Observe changes to a local variable in a function
- B. Capture a real-time trace of program execution
- C. Debug boot code, before a call to the C main() function
- D. Stop the processor at an interesting location in the code

Answer: A

Question: 8

When the processor is executing in Thumb state, which of the following statements is correct about the values stored in R15?

- A. Bits[31:16] are duplicated with bits[15:0]
- B. The PC value is stored in bits[31:1] and bit[0] is treated as zero
- C. The PC value is stored in bits[31:16] and bits[15:0] are undefined
- D. The PC value is stored in bits[15:0] and bits[31:16] are undefined

Answer: B

Question: 9

A standard performance benchmark is being run on a single core ARM v7-A processor. The performance results reported are significantly lower than expected. Which of the following options is a possible explanation?

- A. L1 Caches and branch prediction are disabled
- B. The Embedded Trace Macrocell (ETM) is disabled
- C. The Memory Management Unit (MMU) is enabled
- D. The Snoop Control Unit (SCU) is disabled

Answer: A

Question: 10

When setting the initial location of the stack pointer and the base address of the heap, the ARM EABI requires that the:

- A. Base address of the heap must be the same as the initial stack pointer.
- B. Stack pointer must be 8-byte aligned.
- C. Heap must be in external RAM.
- D. Initial stack pointer must be the lowest addressable memory location.

Answer: B

Question: 11

In an ARMv7-A processor, which control register is used to enable the Memory Management Unit (MMU)?

- A. The ACTLR
- B. The SCTL
- C. The TTBCR
- D. The CONTEXTIDR

Answer: B

Question: 12

A simple method of measuring the performance of an application is to record the execution time using the clock on the wall or a wristwatch. When is this method INAPPROPRIATE?

- A. When executing the software using a simulation model
- B. When the processor is a Cortex-R4
- C. When instruction tracing is enabled
- D. When the processor is not executing instructions from cache

Answer: A

Question: 13

Consider the following code sequence, executing on a processor which implements ARM Architecture v7-A.

LDR r0, [r1]

STR r0, [r2]

STR r3, [r3]

R1 points to a location in normal memory. R2 and R3 point to device memory.

Which of the following statements best describes the ordering rules which apply to this sequence?

- A. The two writes to device memory will happen in program order, but the read can be performed out of order
- B. The memory accesses can happen in any order
- C. The memory accesses will happen in program order
- D. The read to r0 and the write from r0 will happen in program order, but the write from r3 can be performed out of order

Answer: C

Question: 14

When using the default ARM tool-chain libraries for bare-metal applications. I/O functionality is rerouted and handled by a connected debugger. This is often referred to as semihosting. Which one of the following explanations BEST describes how this feature can be implemented by a debugger?

- A. The library directly sends I/O requests to the debugger using the JTAG connection
- B. While the target is running, the debugger processes I/O requests from a shared queue in memory
- C. The I/O library calls rely on an Ethernet connection to redirect the requests to the debugger
- D. The I/O library calls generate an exception that is trapped and handled by the debugger

Answer: D

Question: 15

The Cortex-A9 processor implements a feature called "small loop mode" which reduces power consumption when executing small loops by turning off instruction cache accesses. Which of the following statements describes a condition that must be satisfied for this mode to be enabled?

- A. The loop must fit into two cache lines
- B. The loop must only contain forward branches
- C. Only integer arithmetic can be used
- D. All variables must be held in registers

Answer: A

Question: 16

Which is the best power saving mode to use while waiting to obtain a lock on a semaphore?

- A. Dormant
- B. Standby
- C. Shutdown
- D. Deep sleep

Answer: B

Question: 17

Which privileged mode can kernel code use to get direct access to the User mode registers R13 and R14?

- A. Abort mode
- B. System mode
- C. Hypervisor mode
- D. Supervisor mode

Answer: B

Question: 18

An Advanced SIMD intrinsic has the prototype:  
`int16x4_t vml_n_s16(int16x4_t a, int16_t b);`  
How many multiplications does this intrinsic compute?

- A. 1 multiplication
- B. 4 multiplications
- C. 16 multiplications
- D. 64 multiplications

Answer: B

Question: 19

Which of the following memory attributes, specified in a translation table entry, could be used to protect a page containing a read-sensitive peripheral from speculative instruction fetches?

- A. S (Secure)
- B. nG (non-Global)
- C. xN (Execute Never)
- D. AP (Access Permission)

Answer: C

Question: 20

An ARMv7 implementation might include the VFPv4-D32 floating point extension. What does the '32' indicate?

- A. The width of the datapath in bits
- B. The number of double precision floating point registers implemented
- C. The number of bits of data that can be loaded or stored at once
- D. The number of integer operations that can be performed simultaneously

Answer: B

Question: 21

It is common to declare structures as "packed" in order to minimize data memory size. Which of the following accurately describes the effect of this?

- A. Members will be stored as bit-fields
- B. Data Aborts will be disabled for all structure accesses
- C. Structure members will be re-ordered so that the smallest are first
- D. Multi-byte members are not required to be naturally aligned

Answer: D

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