**FPGA TIMING CLOSURE**

Q1- What is static timing analysis? What is setup time? What is hold time? How do you calculate the maximum clock frequency of a digital circuit?

A1-

Q2- What is clock distribution network? What is clock skew?

A2-

Q3- What is synchronous design methodology?

A3-

Q4- What is metastability? In which conditions metastability can occur? How do you decrease the possibility of metastability?

A4-

Q5- What are the proper ways for communicating two digital circuits having different clock domains?

A5-

Q6- What is pipelining? Does pipelining decrease latency? Does pipelining increase throughput?

A6-

Q7- What is clock gating? What is the advantage and disadvantage of clock gating?

A7-

Q8- What is critical path? How do you find critical path?

A8-

Q9- What kind of timing constraints do you know?

A9- Clock, input, output. False path, multicycle path, maximum/minimum delay.

**FPGA COMMUNICATION INTERFACE**

Q1- What is UART protocol? How can you implement it on FPGA? Give implementation details for receive and transmit modules.

A1-

Q2- What is SPI protocol? What does QSPI stands for? Name the ports and their functions in SPI.

A2-

Q3- What is I2C protocol? Name the ports and their functions in I2C.

A3-

Q4- What is the difference between single-ended and differential communication?

A4-

Q5- What is the difference between half-duplex and full-duplex communication?

A5-

Q6- How can you implement Ethernet on FPGA?

A6-

Q7- What is SERDES? When do you need to use it?

A7-

Q8- How can you communicate with DDR memory in FPGA?

A8- MIG (Memory Interface Generator)

Q9- What is JESD204 protocol? What is LVDS protocol? What are their differences?

A9-

Q10- What is FMC? When to use it?

A10-

**AVIONICS & SPACE**

Q1- What is DO-254?

A1-

Q2- What is MIL-STD-1553 standard? What is ARINC-429 standard? What is SpaceWire standard?

A2-

Q3- What is single event upset (SEU)? How do you prevent it?

A3- TMR (Triple Modular Redundancy)

**SYSTEM-ON-CHIP (SOC)**

Q1- What is AXI protocol? Name different AXI protocol types and talk about their properties.

A1-

Q2- Name some modules and/or algorithms you want to implement on FPGA rather than CPU and tell the reasons.

A2-

Q3- Name some modules and/or algorithms you want to implement on CPU rather than FPGA and tell the reasons.

A3-

Q4- What is DMA? When do you need to use DMA?

A4-

**VHDL – DIGITAL DESIGN - MISC**

Q1- What is the difference between non-volatile and volatile memory? Name some of them.

A1-

Q2- What is the difference between DRAM and SRAM? What are the pros and cons?

A2-

Q3- What is QSPI Flash memory and what is its usage in FPGA systems?

A3-

Q4- How do you pass parameters to a module in VHDL?

A4-

Q5- If you add 3 5-bit number, what should be the proper output bit length?

A5-

Q6- If you add 8 8-bit number, what should be the proper output bit length?

A6-

Q7- How do you represent floating point numbers in digital systems?

A7-

Q8- What is IEEE-754 format?

A8-

Q9- What is fixed-point? What are the pros and cons of using it over single precision?

A9-

Q10- What is the difference between ASIC and FPGA? Pros & Cons?

A10-

Q11- What is debounce?

A11-

Q12- What functions can you implement on LUTs?

A12- Combinational logic – Shift register – Distributed RAM

Q13- What are the memory resources in an FPGA?

A13-

Q14- Can you configure FPGA pins behaviors during configuration?

A14- PUDC (Pull-Up During Configuration)

Q15- If you multiply 8 8-bit number, what should be the proper output bit length?

A15-