



DVD - Review Quiz 1  
Monsoon 2022

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\* Required

Name \*

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Roll No. \*

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Q1. Why are Via's now made of copper and not tungsten? 1 point

- ☒ A. With Copper we can make two tiers of etching
- ☒ B. Both via and metal can be made in a single step which will save money
- ☐ C. Copper offers more ductility
- ☒ D. Copper is less resistive

Why is the cost of mask set for advanced technology nodes like 32nm or 22nm very high?

- ☒ Complex mask patterns are required to design features reliably.
- ☐ Due to complexity of mask pattern, cost of mask set shoots down.
- ☒ Due to complexity of mask pattern, cost of the mask set shoots up.
- ☒ More number of masks in a mask-set.

Which factor determines the diameter of the wafer in the Czochralski process?

- ☐ Orientation at which the seed is dipped into the molten silicon
- ☒ Speed at which the ingot is pulled out
- ☐ Purity of the molten silicon used
- ☐ Size of the initial seed used

In an Inverter design increasing  $W_p$  (Width of Pmos) from 0.135 to 0.2 keeping other parameters constant will result in

- ☐ Increased Rise Delay  
☐ Decrease in Fall Delay  
☐ Increase in Fall Time  
☒ Decrease in Rise Delay

Why is low power design necessary? 1 point

- ✔ Its good for environment
- ✔ It prolongs battery life in portable devices
- ✔ It reduces the size of the battery needed for a given ON time
- ✔ It reduces the cost of packaging and therefore improves profitability

Which of the following have helped in the exponential growth of electronics in the past few decades

- ☒ Moore's Law
- ☒ Dennard Scaling
- ☒ Pollocks Law
- ☐ Murphy's Law

Why are there so many iterative steps and verifications in VLSI Design flow? 1 point

- ☐ VLSI engineers are stupid.
- ☒ Cost of correcting a mistake increases as we go closer to fabrication stage
- ☐ Designers don't trust the data coming from the other team
- ☒ VLSI Design is very complex and therefore one can make errors. Its important to verify at every step to avoid higher costs of rework in later stages

Which of the following are true with respect to rotated substrate? 1 point

- ☒ Crystals have anisotropic properties. So, conductivity changes when direction of flow of current changes.
- ☐ Centrifugal forces that come into picture due to rotation of substrate increase speed of holes
- ☒ When direction of current flow changes, heavy holes start to behave as light holes and their mobility increases
- ☒ Electron mobility is not impacted in rotated substrate

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