14.04.2025

MNT 503
Nanoscale Synthesis and Characterization
(2024-2025 Spring)

Assignment 3

1- Choose the correct statement about lithography technique

☐ it is a bottom up approach
☐ lithography technique involves only photolithograpy
☐ photolithography uses light to transfer a geometric pattern from a photomask to a photoresist coating
☐ e-beam lithography uses X-rays to transfer a geometric pattern from a photomask to a photoresist coating
☐ lithography can be used to produce nano particles from a solution

2- Which one of the followings is correct statement about semiconductors

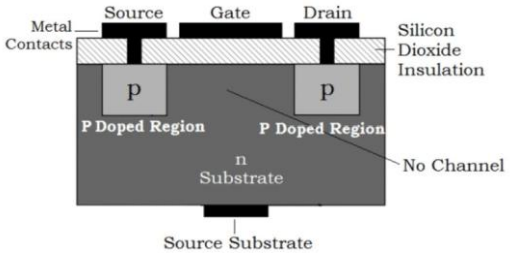
☐ semiconductors are divided into two main groups, namely, extrinsic and intrinsic
☐ Pure Silicon is classified as intrinsic semiconductor
☐ Intrinsic semiconductors are made extrinsic by adding some elements in minor concentration, which is called DOPING
☐ n-type Si and p-type Si (4A group element) are formed by adding an element from 5A and 3A group, respectively
☐ all of them

3- Choose the odd one out about n-type semiconductors

☐ conduction is achieved mainly by holes
☐ conductivity equation for n-type semiconductor can be written as $\sigma \approx p|e|\mu_p$
☐ their electrical conductivities are higher than intrinsic semiconductors
☐ n-type Si can be obtained by doping of Boron (3A group)
☐ n-type semiconductors are useless in semiconductor industry

4- A transistor in an integrated circuit (IC);

☐ can be produced by lithographic techniques
☐ it contains three terminals: source, drain and gate
☐ can be used for switching and amplifying electronic signals
☐ it is a kind of p-n junction
☐ all of them are true



5- IC is a complex layering of semiconductor wafers, copper, and other materials, which interconnect to form transistors, resistors or other components in a circuit.....**T F**