

Assignment

Course Title : Physics of Nanotechnologies

Course Code: BS (PHYS 412), MSC (PHYS 612) **Total Marks:** 30

BS VIII(2016-20) - MSc IV(2018-20) Physics **Semester:** Spring 2020

Submission Date: 26-04-2020

Teacher Name: Dr. Muhammad Zahid Ishaque

Question # 1.

- (a) Define 2D nanomaterials by giving an example. Write down name of any 2D nanodevices used in daily life. (2)
- (b) Describe briefly two fundamental challenges regarding continuation of Moore's law. (2)
- (c) Describe briefly with the help of examples for two different magnetic properties of materials that **how and why** these properties changes at nanoscale. (3+3)
- (d) What are three fundamental challenges regarding production of grapheme on industrial scale. Why we need to overcome each of these challenges. (3+3)

Question # 2.

- a) Describe briefly different steps of making a nanostructure on a bare substrate using optical lithography with the help of schematics for each step. (4)
- b) Can we make multilayer nanodots on a substrate, e.g, Substrate\Co\Cu\Ni trilayer nanodots, using optical lithography. If possible then briefly explain how. (2)

Question # 3.

- a) Describe briefly any one application of nanomaterials in any field of life other than described in your lecture notes. First highlight challenges regarding that specific application, then explain complete working of that application to address these challenges. (8)
