M. Tech. –IV (Chemical Engineering) (CBCS – 2015 Course) :
SUMMER - 2019
SUBJECT: SELF STUDY PAPER-II-NANOSCIENCE

Day: Thursday
Date: 13/06/2019 **S-2019-3585** Time: 11.00 AM TO 02.00 PM
Max Marks: 60

N.B

1) All questions are **COMPULSORY**
2) Figures to the right indicate FULL marks.
3) Answer to both the sections should be written in **SAME** Answer book.
4) Assume suitable data if necessary.
5) Use of non-programmable pocket calculator is permitted.

SECTION - I

Q.1 Explain various types of surface & dimensional species possessed by nanostructures. **(10)**

OR

Q.1 Define nanomachine. Explain various types of nanomachines with their applications. **(10)**

Q.2 Explain the following methods for synthesis of nanomaterials **(10)**
i) Mechanical grinding
ii) Chemical vapor condensation

OR

Q.2 Explain structure & properties of polymer matrix nanocomposites. **(10)**

Q.3 Write notes on: **(10)**
i) Length & time scale in nanostructures.
ii) Plasticity of nanoparticles.

OR

Q.3 Explain the inter-dynamic aspect of molecular forces in nanomaterial. **(10)**

SECTION - II

Q.4 Elaborate the terms: **(10)**
i) Micelle
ii) Nanowires
iii) Quantum dots
iv) Nanotubes
v) Nanofilms

OR

Q.4 How the biological membranes act as nanomachine in certain biological activities? Explain with example. **(10)**

Q.5 Enlist the methods for synthesis of CNT's and explain various properties of CNT's. **(10)**

OR

Q.5 Explain the influence of nanostructuring on magnetic and mechanical properties of metals. **(10)**

Q.6 How the tailored monolayes of gold nanoparticles are synthesized? Explain in detail. **(10)**

OR

Q.6 Explain various spectroscopic. Methods employed for characterization of SAM's. **(10)**

* * * *