M. TECH. (NANO TECHNOLOGY) SEM-II (CBCS – 2015 COURSE) : SUMMER - 2018

SUBJECT: ENERGY, ENVIRONMENT, SAFETY AND COMMERCIALIZATION FOR NANOTECHNOLOGY

Day: **Monday** | **S-2018-2947** | Time: **11.00 AM TO 02.00 PM**

Date: **18/06/2018** | Max. Marks: 60

N.B.:

1) All questions are **COMPULSORY**.
2) Figures to the right indicate **FULL** marks.
3) Draw neat and labeled diagram **WHEREVER** necessary.

SECTION-I

Q.1 Discuss the *'Micro fuel cell technology'*. State the need of micro fuel cells. How can Nanotechnology help in this regard? **(10)**

OR

Describe the *'Renewable energy technology'*. State its advantages and limitations.

Q. 2 Describe the '*Energy supply chain'* as also the implications of each parameter affecting it. **(10)**

OR

Describe in details various microfabrication techniques to obtain nano optimized fuel cells.

Q.3 Describe gas sensors and bio sensors. How are these useful to monitor contaminations in environment and health? **(10)**

OR

With a neat sketch explain the construction and working of NEMS based systems.

SECTION II

Q.4 Define '*Ecotoxicology'*. Describe its influence on the environment as well as Nanotechnology aided strategies to combat the same. **(10)**

OR

Write brief notes on:

a) Guidelines adopted for design of a new nano product
b) Toxic health effects upon chronic exposure to CNTs

Q.5 Give an overview of the role of nanomaterials in the '*Energy sector'*. Give suitable examples. **(10)**

OR

Explain the Hydrogen storage kinetics and suitability for its storage using
a) CNTs b) metal hydrides

Q. 6 Describe in details various recommended engineering controls while handling nanomaterials at laboratory level. **(10)**

OR

Write short notes on :

a) Hazardous health effects of polychlorinated biphenyls (PCBs)
b) Sensitivity analysis

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