

**M. TECH. (NANO TECHNOLOGY) SEM-II (CBCS – 2015
COURSE) : WINTER - 2017**

**SUBJECT: ENERGY, ENVIRONMENT, SAFETY AND COMMERCIALIZATION FOR
NANOTECHNOLOGY**

Day: **Thursday**
Date: **30/11/2017**

W-2017-2753

Time: **11.00 AM TO 02.00 PM**
Max. Marks: 60

N.B.:

- 1) All questions are **COMPULSORY**.
 - 2) Both the sections should be written in **SEPARATE** answer books.
 - 3) Figures to the **RIGHT** indicate **FULL** marks.
 - 4) Draw neat labeled diagrams **WHEREVER** necessary.
 - 5) Assume suitable data, if necessary.
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SECTION –I

Q.1 Describe the nano-optimized fuel cells. Which micro fabrication techniques are used to make them?

OR

Classify various micro fuel cells. Describe the working of any one micro fuel cell.

Q.2 Describe the working of any one NEMS based device. What materials are useful for NEMS development?

OR

Describe the role of Nanotechnology in Energy Sector.

Q.3 Elaborate the role of thin films in enhancing the energy storage in rechargeable batteries.

OR

Discuss the Energy supply chain. State the role of Nanotechnology for the same.

SECTION –II

Q.4 Describe the challenges faced for Hydrogen storage. Which types of alternatives are currently being studied for the same?

OR

Discuss the toxicity of nanoparticles to the respiratory system.

Q.5 What are polychlorinated biphenyls? How are they toxic to humans?

OR

Discuss various measures to be undertaken for the laboratory handling of nanomaterials.

Q.6 What are the elements of economic analysis of Nano-engineered products?

OR

Which nano-materials are dispersed in the environment due to

- a) Water remediation strategies.
- b) Paint industries
- c) Food packaging technologies.

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