

**M. TECH. (NANO TECHNOLOGY) SEM-III (CBCS – 2015 COURSE) :**  
**WINTER - 2017**  
**SUBJECT : ELECTIVE 2 : NANO COMPOSITES**

Day : **Thursday**  
Date : **18/01/2018**

**W-2017-2761**

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) Answers to both the sections should be written in the **SEPARATE** answer books.
- 4) Use of non-programmable calculator is **ALLOWED**.
- 5) Draw neat and labeled diagram **WHEREVER** necessary.
- 6) Assume suitable data, if necessary.

**SECTION - I**

**Q. 1** What is Nanocomposite? Explain with the suitable example synthesis process of any metal oxide nano-composite. State its properties. **(10)**

**OR**

State the five applications of metal oxide nanocomposite and metal ceramic nanocomposite with suitable examples. **(10)**

**Q. 2** State the application of CNT's in polymer nanocomposite with suitable example. State its properties and challenges associated with the use of CNT's. **(10)**

**OR**

What is Diblock copolymer nanocomposite? Explain the synthesis process of it. State the characterization tool used for it. **(10)**

**Q. 3** Explain with suitable example composition of nanocomposite for thermal applications. Which thermal properties are targeted while their development? State their areas of applications. **(10)**

**OR**

Explain with suitable example of nanocomposite which enhanced magnetic properties with suitable example. State its applications and characterization techniques. **(10)**

**SECTION - II**

**Q. 4** How development of nanocomposite transcend into replacement of amputated limbs? State the composites used for developments of critical limbs. **(10)**

**OR**

What types of nanocomposites are used for drug delivery? State their composition and steps of implementations. **(10)**

**P. T. O.**

**Q. 5** What is Nanomotors? Explain nanomotors with suitable example and state applications of nanomotors. **(10)**

**OR**

What are natural Bio-nanocomposites? List the natural Bio-nanocomposites and state their applications. **(10)**

**Q. 6** Explain the principle of SEM. What kind of sample preparation is required to image bio nano-materials using this technique? **(10)**

**OR**

Explain environmental SEM? How it can be used for characterization of bio-nanomaterials? What are its advantages over conventional SEM? **(10)**

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