

**R09**

**Code No: 58133**

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**

**B. Tech IV Year II Semester Examinations, May - 2017**

**NANO COMPOSITES**

**(Material Science and Nano Technology)**

**Time: 3 Hours**

**Max. Marks: 75**

**Answer any Five Questions  
All Questions Carry Equal Marks**

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- 1.a) State what is a composite material and how different a nanocomposite is when compared with bulk composites?
- b) Write in detail about stress-strain relationship and toughness of nanocomposite materials? [6+9]
2. Write in detail about metal matrix nanocomposites? List out their applications. [15]
3. Write in detail about properties, applications and give a few examples of the following:
  - a) Carbon nanotube based nanocomposites
  - b) Biologically inspired nanocomposites. [8+7]
- 4.a) What are the various synthesis methods for producing Nanocomposites? Explain the principle behind synthesis of nanocomposite materials using Thermal Spray technique.
- b) List out the advantages and disadvantages of mechanical alloying process. [8+7]
5. Write in detail about Thin Film nanocomposites. Write the role of these composites in solar energy conversion applications. [15]
- 6.a) Define what is molecular dynamics.
- b) Write in detail about computational continuum modeling of nanocomposites. [5+10]
7. Write in detail about the following polymer nanocomposites techniques:
  - a) Solution-casting method processing
  - b) Solution impregnation. [8+7]
- 8.a) Explain in detail about Pressure infiltration technique for processing nano composites.
- b) List out the merits and demerits of stir casting technique. [7+8]

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