

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATION)**

CLASS: BE
BRANCH: CHEM. ENGG./CEP&P

SEMESTER: VII
SESSION: MO/2018

SUBJECT: CL7015 NANO TECHNOLOGY

TIME: 1.5 HOURS

FULL MARKS: 25

INSTRUCTIONS:

1. The total marks of the questions are 30.
2. Candidates may attempt for all 30 marks.
3. In those cases where the marks obtained exceed 25 marks, the excess will be ignored.
4. Before attempting the question paper, be sure that you have got the correct question paper.
5. The missing data, if any, may be assumed suitably.

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- Q1 (a) Define nanotechnology. Give two examples each of materials naturally occurring at nanoscale and man-made nanomaterials [2]
(b) What are advantages of nanotechnology? [3]
- Q2 (a) Write different modes of classification of Nanomaterials. [2]
(b) Describe top-down and bottom-up approaches for preparation of nanomaterials [3]
- Q3 (a) Compare the chemical and physical structures of carbon nanotubes and graphene. [2]
(b) Explain Electrical, magnetic, optical, thermal, and mechanical properties of carbon nanotubes. [3]
- Q4 (a) For carbon nanotube reinforced composite, how can you improve the interface properties? [2]
(b) How carbon nanotube prepared by Chemical Vapor Deposition? [3]
- Q5 (a) What are advantages of soft template method over hard templet approach? [2]
(b) Describe the synthesis of nanostructured polyaniline by interfacial polymerization approach [3]
- Q6 (a) How can you explain the fact that the electrical conductivity of nanostructured polyaniline is superior than macro-structured PANI? [2]
(b) How nanostructured polyaniline could be a good material for gas sensor application? [3]

::: 13/09/2018 :::M