

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VIII • EXAMINATION – SUMMER • 2015****Subject Code: 182104****Date:05/05/2015****Subject Name: NANO- MATERIALS AND TECHNOLOGY****Time: 10.30AM-01.00PM****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) Compare bulk and nano properties of materials. **07**
(b) Discuss scope & applications of nanotechnology. **07**
- Q.2** (a) Give classification of nanomaterials and enlist basic building blocks for nano materials. **07**
(b) Differentiate between top down and bottom-up approach of synthesis. **07**
- OR**
- (b) Explain physical vapor deposition technique for nano materials. **07**
- Q.3** (a) Explain sol-gel method of nano material synthesis. **07**
(b) Explain the process of plasma deposition for nano material production. **07**
- OR**
- Q.3** (a) Discuss effect of grain size on mechanical properties of nano structured materials. **07**
(b) Write short note on fullerenes and carbon nano tubes. **07**
- Q.4** (a) List characterization techniques for nano materials and explain transmission electron microscopy (TEM). **07**
(b) Discuss the process of mechanical milling for nano material production and enlist process controlling factors. **07**
- OR**
- Q.4** (a) Discuss sintering process for nano powders. **07**
(b) Discuss atomic force microscopy (AFM) for characterization of nano materials. **07**
- Q.5** (a) Explain the chemical vapour deposition technique for nano-material production. Give the advantages of this method. **07**
(b) Explain self-assembly as nanofabrication techniques. **07**
- OR**
- Q.5** (a) Write note on nano composite materials. **07**
(b) Write shortnote on hot isostatic pressing (HIP) for nano powder consolidation. **07**
