

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI • EXAMINATION – SUMMER 2013****Subject Code: 162103****Date: 28-05-2013****Subject Name: Powder Metallurgy****Time: 10.30 am - 01.00 pm****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) What is Powder Metallurgy? With a flow sheet explain briefly basic powder metallurgy process steps. **07**
- (b) List advantages (process, metallurgical, commercial) and limitations of powder metallurgy. List examples of powder metallurgy products. **07**
- Q.2** (a) What is atomization? List atomization techniques. With neat sketch explain water atomization technique. **07**
- (b) Describe briefly: Apparent density, Tap density, Flaw rate. **07**
- OR**
- (b) List the methods for determination of particle size and particle size distribution of metallic powder. Explain sieve analysis method. **07**
- Q.3** (a) What do you understand by metal powder characteristics? Explain briefly their effects during compacting and sintering operations. **07**
- (b) List the techniques of powder manufacture by mechanical processes. Discuss ball milling and explain the importance of critical speed. **07**
- OR**
- Q.3** (a) List various pre-treatments to which powders are subjected to before compaction. Explain why they are necessary. **07**
- (b) What are the basic principles of compacting? Discuss briefly different types of die compaction techniques. **07**
- Q.4** (a) Explain the necessity of use of lubricants in the die compaction of powders. Discuss commonly used lubricants. **07**
- (b) Discuss isostatic pressing. What are its advantages over die compaction? **07**
- OR**
- Q.4** (a) Write a short note on powder rolling. **07**
- (b) What is sintering? Discuss the mechanism of sintering. **07**
- Q.5** (a) What is liquid phase sintering? What are its advantages? **07**
- (b) Discuss manufacturing of porous bearings by powder metallurgy technique. **07**
- OR**
- Q.5** (a) Why cemented carbide tools are produced by powder metallurgy technique? Explain its manufacturing process. **07**
- (b) Write a short note on sintering furnaces. **07**
