

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE- VI<sup>th</sup> SEMESTER-EXAMINATION – MAY- 2012****Subject code: 162103****Date: 15/05/2012****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) Discuss various steps of powder rolling. Give the advantages and disadvantages of powder rolling. **07**  
 (b) Describe the hot isostatic pressing method for powder compaction. Also give its advantages. **07**
- Q.2** (a) Describe various advantages, limitations and applications of powder metallurgy. **07**  
 (b) Define Mechanical alloying. Enlist important parameters of a mill. Explain different steps of mechanical alloying. **07**
- OR**
- (b) Enlist different powder production methods. Briefly explain the reduction process for powder production. **07**
- Q.3** (a) Explain atomization method for powder production and compare it with electrolytic deposition method. **07**  
 (b) Briefly explain the effect of particle size, shape and size distribution on the properties of final sintered compact. **07**
- OR**
- Q.3** (a) Briefly explain the carbonyl process for production of powders. Mention factors affecting process. **07**  
 (b) Define apparent density and tap density of powders. Differentiate these two. **04**  
 (c) Define flow rate of powders. How it is measured? **03**
- Q.4** (a) Enlist different powder compaction methods. Describe the role of lubricants in the die compaction of powders. **07**  
 (b) What do you mean by metallic filters? Discuss their production method. Give their applications. **07**
- OR**
- Q.4** (a) Explain the die compaction process. Enlist the factors to be considered for die design. **07**  
 (b) Define sintering. Describe various stages of sintering. **07**
- Q.5** (a) With the help of suitable examples explain the function of different sintering atmospheres. **07**  
 (b) What do you mean by electrical contact materials? How these are produced by powder metallurgy. Mention their applications. **07**
- OR**
- Q.5** (a) Explain the mechanism of liquid-phase sintering. Give advantages of this process. **07**  
 (b) What are the sintered friction materials? Explain different steps of their production. Write their applications. **07**

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