

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI • EXAMINATION – WINTER • 2014****Subject Code: 162103****Date: 01-12-2014****Subject Name: Powder Metallurgy****Time: 02:30 pm - 05:00 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 do you understand by powder metallurgy? Using flow chart show steps of powder metallurgy. List applications of powder metallurgy. **07**
(b) List methods of powder production. Discuss in detail water atomization process. **07**
- Q.2** (a) Name mechanical methods of powder production. Explain objective and mechanism of milling. **07**
(b) Define: (i) Aspect ratio (ii) Shape factor (iii) Apparent density (iv) Tap density (v) Flow rate (vi) Angle of repose (vii) Porosity. **07**
- OR**
- (b) List the powder characteristics that affect the properties of final product and explain their effects. **07**
- Q.3** (a) Explain in detail Electrodeposition method of powder production. **07**
(b) What are various steps of powder conditioning prior to compaction? Explain blending and mixing of powder. **07**
- OR**
- Q.3** (a) Explain with suitable diagrams variation of density during compaction. What is the reason for green density variation across sample length in single die compaction? How it can be improved? **07**
(b) Explain single and double action presses. What is the effect of lubricants? List commonly used lubricants. **07**
- Q.4** (a) Write a short note on powder rolling. **07**
(b) Why sintering is necessary after compaction? Explain sintering stages with suitable diagrams. **07**
- OR**
- Q.4** (a) Explain production of carbide tools by powder metallurgy. **07**
(b) Discuss effect of sintering variables on properties of sintered products. **07**
- Q.5** (a) Explain Isostatic pressing process. **07**
(b) Write short note on powder extrusion process. **07**
- OR**
- Q.5** (a) Discuss advantages and limitations of powder metallurgy. **07**
(b) Explain the importance of die design for compaction. Discuss the die materials generally used for compaction. **07**
