

GUJARAT TECHNOLOGICAL UNIVERSITY
B. E. - SEMESTER – VI • EXAMINATION – WINTER 2012

Subject code: 162103**Date: 04/01/2013****Subject Name: Powder Metallurgy****Time: 02.30 pm - 05.00 pm****Total Marks: 70****Instructions:**

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

- Q.1** (a) Compare powder metallurgy route of component production with conventional route in terms of advantages, limitations and applications. **07**
(b) Define sintering. State and describe various stages and process variables of sintering. **07**

- Q.2** (a) What is isostatic pressing? Explain the hot isostatic pressing technique for powder compaction. **07**
(b) Give your comments on the effect of particle size, shape and size distribution on the properties of final sintered compact. **07**

OR

- (b) Define and explain: 1. Apparent density 2. Tap density 3. Flow rate. **07**

- Q.3** (a) Describe the mechanical alloying process for powder production. Discuss factors affecting process. **07**
(b) List different atomization processes and explain any one for metal powder production. **07**

OR

- Q.3** (a) Enlist different powder production methods. Briefly explain the carbonyl process for powder production. **07**
(b) Write a note on alloy powder production methods. **07**

- Q.4** (a) What do you mean by density distribution? Describe its effect on properties of compacts. **07**
(b) Write a note on powder extrusion method. Give the advantages and limitations. **07**

OR

- Q.4** (a) Define compaction. Explain the role of lubricants in compaction processes with the help of suitable example. **07**

- Q.4** (b) Discuss the effect of various sintering atmospheres on the final sintered products. **07**

- Q.5** (a) Describe the liquid-phase sintering process in detail. **07**
(b) Explain the method of production of cemented carbide tool materials. Enlist their applications. **07**

OR

- Q.5** (a) Describe the die compaction process. Discuss the factors affecting die design. **07**

- (b) What do you mean by sintered bearings? How these are produced by powder metallurgy. Mention their applications. **07**
