

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI (NEW) EXAMINATION – SUMMER 2022****Subject Code:3162103****Date:08/06/2022****Subject Name:Powder Metallurgy****Time:10:30 AM TO 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.
4. Simple and non-programmable scientific calculators are allowed.

| | MARKS |
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| Q.1 (a) Differentiate apparent density and tap density of powders. | 03 |
| (b) Explain effect of particle size and shape on properties of final sintered | 04 |
| (c) Describe advantages, limitations and applications of powder metallurgy. | 07 |
| Q.2 (a) Write applications of sintered bearings. | 03 |
| (b) Briefly explain carbonyl process for powder production. | 04 |
| (c) Describe atomization method for powder production. | 07 |
| OR | |
| (c) List different powder production methods. Briefly explain reduction process. | 07 |
| Q.3 (a) Give the advantages and disadvantages of powder rolling. | 03 |
| (b) Discuss various steps of powder forging. | 04 |
| (c) Explain the die compaction process. | 07 |
| OR | |
| Q.3 (a) What do you mean by compaction? Enlist different powder compaction methods. | 03 |
| (b) Describe role of lubricants in the die compaction of powders. | 04 |
| (c) Define flow rate of powders. Explain method to measure it. | 07 |
| Q.4 (a) Write applications of sintered friction materials. | 03 |
| (b) Enlist the factors to be considered for die design. | 04 |
| (c) Explain the mechanism of liquid-phase sintering. Give advantages of this process. | 07 |
| OR | |
| Q.4 (a) What is pressure less powder shaping? | 03 |
| (b) Discuss the function of sintering atmospheres. | 04 |
| (c) Define sintering. Describe various stages of sintering. | 07 |
| Q.5 (a) Discuss advantages of hot isostatic pressing for powder compaction. | 03 |
| (b) Explain different steps of mechanical alloying. | 04 |
| (c) Write a note on defects in powder metallurgy components and their control measures. | 07 |
| OR | |
| Q.5 (a) Enlist important parameters of a mechanical mill. | 03 |
| (b) Describe the hot isostatic pressing method for powder compaction. | 04 |
| (c) Explain how electrical contact materials are produced by powder metallurgy. List their applications. | 07 |
