

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-VI (NEW) EXAMINATION – SUMMER 2024****Subject Code:3162103****Date:22-05-2024****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
<b>Q.1</b>	(a) Mention factors affecting reduction process for powder production.	<b>03</b>
	(b) Describe advantages and limitations of powder metallurgy.	<b>04</b>
	(c) Explain method to measure particle size and shape of metal powders by Optical Microscopy.	<b>07</b>
<b>Q.2</b>	(a) What do you mean by metallic filters? Give their applications.	<b>03</b>
	(b) Discuss production method of metallic filters.	<b>04</b>
	(c) Explain atomization method for powder production.	<b>07</b>
<b>OR</b>		
	(c) Explain different steps of mechanical alloying. List parameters of a mill.	<b>07</b>
<b>Q.3</b>	(a) Differentiate apparent density and tap density of powders.	<b>03</b>
	(b) Explain effect of particle size and size distribution on properties of final sintered compact.	<b>04</b>
	(c) Discuss various steps of powder extrusion. Give the advantages.	<b>07</b>
<b>OR</b>		
<b>Q.3</b>	(a) Mention factors affecting carbonyl process.	<b>03</b>
	(b) Discuss method to measure tap density of given powder sample.	<b>04</b>
	(c) Describe various steps of powder rolling. Give advantages and disadvantages.	<b>07</b>
<b>Q.4</b>	(a) Discuss the role of lubricants in the die compaction of powders.	<b>03</b>
	(b) Explain different steps of antifriction materials production.	<b>04</b>
	(c) Describe hot isostatic pressing method for powder compaction. Give its advantages.	<b>07</b>
<b>OR</b>		
<b>Q.4</b>	(a) What are the antifriction materials? Write their applications.	<b>03</b>
	(b) List possible defects in powder metallurgy products. Discuss any one.	<b>04</b>
	(c) Explain die compaction process. Enlist factors to be considered for die design.	<b>07</b>
<b>Q.5</b>	(a) Discuss significance of flow rate of powders.	<b>03</b>
	(b) Describe the function of different sintering atmospheres.	<b>04</b>
	(c) Describe mechanism of liquid-phase sintering. List its advantages.	<b>07</b>
<b>OR</b>		
<b>Q.5</b>	(a) What are the sintered bearings? List their applications.	<b>03</b>
	(b) Describe various stages of sintering.	<b>04</b>
	(c) Write a note on sintering furnaces.	<b>07</b>

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