

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI (NEW) EXAMINATION – SUMMER 2023****Subject Code:3162103****Date:12-07-2023****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
Q.1 (a) Describe advantages of powder metallurgy.	03
(b) Briefly explain the reduction process for powder production.	04
(c) Explain water atomization method for powder production.	07
Q.2 (a) What do you mean by metallic filters? Give their applications.	03
(b) Describe the function of different sintering atmospheres.	04
(c) Explain the liquid-phase sintering process. Give advantages.	07
OR	
(c) Define sintering. Describe various stages of sintering.	07
Q.3 (a) Discuss limitations of powder metallurgy.	03
(b) Describe the method to measure flow rate of powders.	04
(c) Explain method to measure tap density and apparent density of powder samples.	07
OR	
Q.3 (a) What are the antifriction materials? Write their applications.	03
(b) Differentiate apparent density and tap density of powders.	04
(c) Explain different steps of mechanical alloying. List important parameters of a mill.	07
Q.4 (a) Give applications of electrical contact materials produced by powder metallurgy.	03
(b) Explain how electrical contact materials are produced by powder metallurgy.	04
(c) Discuss various steps of powder forging. Give the advantages and limitations of powder forging.	07
OR	
Q.4 (a) Differentiate in Single and double die compaction.	03
(b) List different possible defects in powder metallurgy route. Discuss any one.	04
(c) Explain various steps of powder rolling. Give the advantages and disadvantages of powder rolling.	07
Q.5 (a) What is compaction? Explain its significance.	03
(b) Discuss role of lubricants in the die compaction of powders.	04
(c) Explain the hot isostatic pressing method for powder compaction.	07
OR	
Q.5 (a) Write advantages of hot isostatic pressing for powder compaction.	03
(b) Discuss the factors to be considered for die design.	04
(c) Explain the effect of particle size, shape and size distribution on the properties of powder metallurgy components.	07
