Seat No.: _____ **Enrolment No._____**

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI (OLD) - EXAMINATION – SUMMER 2017

Subject Code: 162103 **Date: 27/04/2017**

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.**

Q.1	**(a)**	What is powder metallurgy? With a flow sheet explain briefly basic Powder metallurgy process steps.	**07**
	(b)	List advantages (process, metallurgical, commercial) and limitations of Powder metallurgy. List examples of powder metallurgy products.	**07**
Q.2	**(a)**	Discuss various steps of powder rolling. Give the advantages and disadvantages of Powder rolling.	**07**
	(b)	Describe the hot isostatic pressing method for powder compaction. Also give its Advantages.	**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)	What do you understand by metal powder characteristics? Explain briefly their effects during compacting and sintering operations.	**07**
		OR	
Q.3	**(a)**	List various pre-treatments to which powders are subjected to before compaction. Explain why they are necessary.	**07**
	(b)	List different atomization processes and explain any one for metal powder production	**07**
Q.4	**(a)**	What do you mean by metallic filters? Discuss their production method. Give their applications.	**07**
	(b)	Discuss critically the factors to be considered for die design.	**07**
		OR	
Q.4	**(a)**	Write short note on powder extrusion technique.	**07**
	(b)	Discuss about sintering furnace and furnace atmospheres.	**07**
Q.5	**(a)**	What do you mean by electrical contact materials? How these are produced by powder metallurgy. Mention their applications.	**07**
	(b)	Discuss manufacturing of porous bearings by powder metallurgy Technique	**07**
		OR	
Q.5	**(a)**	How self-lubricated bearings are produced by powder metallurgy Technique?	**07**
	(b)	Using flow sheet explain manufacturing of cemented carbide tools by Powder metallurgy.	**07**

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