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

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI- EXAMINATION – SUMMER 2016

Subject Code: 162103 **Date: 09/05/2016**

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)**	Explain how electrical contact materials are produced by powder metallurgy route. Write applications of electrical contact materials.	**07**
	(b)	Describe liquid-phase sintering process and mention process affecting factors.	**07**
Q.2	**(a)**	Define powder metallurgy. Discuss advantages of powder metallurgy compare to other routes. Enlist limitations and applications of it.	**07**
	(b)	Explain effect of particle size, shape and size distribution on properties of the final sintered compact.	**07**
		OR	
	(b)	Differentiate between apparent density and tap density of powders. How flow rate of powders is measured.	**07**
Q.3	**(a)**	Explain mechanical milling method with mechanism for powder production. Give process controlling factors.	**07**
	(b)	Briefly explain the carbonyl process for powder production. Describe process affecting factors.	**07**
		OR	
Q.3	**(a)**	What is atomization? Explain atomization method for powder production.	**07**
	(b)	Describe briefly reduction process for iron powder production.	**07**
Q.4	**(a)**	Enlist different powder compaction methods. Describe the role of lubricants in the die compaction of powders.	**07**
	(b)	Define extrusion. Write short note on powder extrusion technique.	**07**
		OR	
Q.4	**(a)**	Define isostatic pressing. Describe hot isostatic pressing method.	**07**
	(b)	Explain the die compaction process. Enlist the factors to be considered for die design.	**07**
Q.5	**(a)**	Describe various stages of sintering. Explain effect of variables on it.	**07**
	(b)	What do you mean by self-lubricated bearings? Explain production method of self-lubricated bearings by powder metallurgy technique.	**07**
		OR	
Q.5	**(a)**	Define sintering. With the help of suitable examples explain the function of different sintering atmospheres.	**07**
	(b)	Describe manufacturing of cemented carbide tools by powder metallurgy route.	**07**

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