Seat No.: _____ Enrolment No.

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VIII EXAMINATION – SUMMER 2020

Subject Code: 2180509 **Date: 29/10/2020**

Subject Name: Fertilizer Technology

Time: 02:30 PM TO 05:00 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 the role of essential elements in plant growth?	**03**
	(b)	Write a short note on fertilizer production and consumption in India.	**04**
	(c)	Explain about classification of fertilizers.	**07**
Q.2	**(a)**	Mention the industrial applications of ammonia.	**03**
	(b)	Discuss about the major engineering problems in the manufacturing of nitric acid.	**04**
	(c)	With a neat sketch, describe manufacturing process of ammonia by Haldor Topsoe Process.	**07**
		OR	
	(c)	With process flow diagram, describe the manufacturing of urea by Stamicarbon's CO_2 stripping process.	**07**
Q.3	**(a)**	Mention applications of Urea.	**03**
	(b)	With process flow diagram, describe any one method of production of Ammonia synthesis gas.	**04**
	(c)	Explain manufacturing of Nitric Acid by pressure ammonia oxidation process.	**07**
		OR	
Q.3	**(a)**	Explain concentration of Nitric acid by $Mg(NO_3)_2$.	**03**
	(b)	Briefly explain the storage and transportation of ammonia**.**	**04**
	(c)	Explain manufacturing of Ammonium nitrate by Prilling process.	**07**
Q.4	**(a)**	Draw neat diagram of Kellogg ammonia converter with all nomenclature.	**03**
	(b)	Describe chemical and physical properties of nitric acid.	**04**
	(c)	Explain in detail manufacturing of potassium nitrate.	**07**
		OR	
Q.4	**(a)**	Describe physical and chemical properties of Potassium Chloride.	**03**
	(b)	Give applications of potassium nitrate.	**04**
	(c)	With neat flow sheet discuss manufacturing of potassium chloride from Sylvinite.	**07**
Q.5	**(a)**	Mention applications of fertilizers considering Nutrient.	**03**
	(b)	Describe about secondary nutrients.	**04**
	(c)	Describe in detail about Phosphate-solubilizing bio-fertilizers.	**07**
		OR	
Q.5	**(a)**	Explain the need of bio-fertilizers.	**03**
	(b)	Write a short note on Macro elements and Micro elements of fertilizers.	**04**
	(c)	Explain any one method of preparation of bio-fertilizers.	**07**

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