Se	at No.	Enrolment No	
		GUJARAT TECHNOLOGICAL UNIVERSITY	
		BE - SEMESTER-VIII (NEW) - EXAMINATION – SUMMER 2017	
Sı	ıbject	Code: 2180509 Date: 06/05/2	2017
Sı	ıbject	Name: Fertilizer Technology(Department Elective - III)	
Ti	me: 1	10:30 AM to 01:00 PM Total Mark	s: 70
Ins	structio	ons:	
	1.	Attempt all questions.	
	2.	ı v	
Λ 1		Figures to the right indicate full marks.	07
Q.1	(a)	Justifying the need for synthetic fertilizers, discuss in detail the development of fertilizer industry, production and consumption of fertilizers in India.	07 07
	(b)	With process flow diagram, describe any one method of production of ammonia synthesis gas.	U/
Q.2	(a)	State the classification of fertilizers. Explain the role of various types of elements in plant growth.	07
	(b)	With process flow diagram, describe the manufacturing of urea by Stamicarbon's CO ₂ stripping process.	07
	(b)	OR Briefly discuss about the application of fertilizer considering nutrient, balance and types of crop. Also discuss the role of bulk blending and distribution of fertilizers in various forms.	07
Q.3	(a)	With a neat process flow diagram, describe the manufacturing of nitric acid by intermediate pressure ammonia oxidation process.	07
	(b)	Discuss in detail the major engineering problems in the manufacture of nitric acid with respect to (i) thermodynamic and kinetic considerations of reactions and (ii) process design modifications.	07
		OR	
Q.3	(a)	Briefly discuss the properties and applications of nitric acid. Also describe the process of concentration of nitric acid by Mg (NO ₃) ₂ .	07
	(b)	Discuss the physical, chemical properties and applications of potassium chloride and potassium nitrate.	07
Q.4	(a)	With a neat process flow diagram, briefly discuss the production of ammonia by Kellogg process.	07
	(b)	With a neat sketch, describe the design aspects of ammonia converters used	07
		in Haldor Topsoe process. OR	
Q.4	(a)	With process flow diagram, briefly describe the manufacturing of ammonium nitrate by prilling process.	07
	(b)	With a neat flow diagram, briefly discuss the manufacture of complex fertilizers.	07
Q.5	(a)	With process flow diagram, briefly describe the manufacturing of potassium chloride from sylvinite.	07
	(b)	State the uses of ammonium sulfate. With reactions, discuss in detail the production of ammonium sulfate using ammonia, carbon dioxide and gypsum.	07
		OR	
Q.5	(a)	Justify the need for using more bio fertilizers. Describe any one method of preparation of bio fertilizers.	07
	(b)	Write short notes on nitrogen-fixing bio fertilizers and phosphate-solubilizing bio fertilizers.	07
