

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER– VIII (New) EXAMINATION – WINTER 2019****Subject Code: 2180509****Date: 25/11/2019****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.
4. Draw neat diagram where necessary.

- Q.1** (a) Define fertilizer with its mechanism. Classify them. **03**
(b) Explain any one granulation process. **04**
(c) Discuss about fertilizer production and consumption in India. **07**
- Q.2** (a) Give applications of ammonia and urea in chemical field. **03**
(b) What is the role of essential elements in plant growth? Discuss about micro and macro elements essential for plant growth. **04**
(c) Write manufacturing process of ammonia by catalytic partial oxidation steam hydrocarbon reforming with neat diagram. Also state physical & chemical properties. **07**

OR

- (c) Write a short note on ammonia converters. **07**
- Q.3** (a) State physical and chemical properties of urea with its applications. **03**
(b) Discuss about storage and transportation of Ammonia. **04**
(c) Explain manufacturing process of Nitric acid by Intermediate pressure ammonia oxidation process with neat diagram. **07**

OR

- Q.3** (a) Draw the diagram of Toyo-Koatsu total recycle process. **03**
(b) Explain shortly about ammonium sulphate from ammonium carbonate and gypsum. **04**
(c) Explain manufacturing process of urea by stamicarbon's CO₂ stripping process. **07**
- Q.4** (a) Enlist physical and chemical properties of given compounds: **03**
(1) Potassium chloride (2) Potassium sulphate (3) Potassium nitrate.
(b) Draw a diagram of manufacturing of Ammonium nitrate by prilling process. **04**
(c) Describe manufacturing of potassium chloride from sylvinit process. **07**

OR

- Q.4** (a) Which types of unit operations needed in manufacturing of various fertilizers? **03**

- (b) Discuss major engineering problems in phosphorous industry. **04**
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- (c) Discuss about preparation of Potassium nitrate and Potassium sulphate. **07**

- Q.5** (a) Define Biofertilizers. Give the types of them. **03**
(b) How the Biofertilizers are essentials for plant growth? **04**
(c) Discuss about any one of the manufacturing process of Miscellaneous fertilizer. **07**

OR

- Q.5** (a) (1).State chemical reaction for producing TSP. **03**
(2).During storage of ammonium nitrate, what care will you take?
(b) Differentiate NSP vs.TSP **04**
(c) Discuss about Phosphate solubilizing biofertilizers. **07**

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