

| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|



GIET MAIN CAMPUS AUTONOMOUS GUNUPUR – 765022
 B. Tech Degree Examinations, December – 2020
 (Seventh Semester)
BCHPE 7031 - FERTILIZER TECHNOLOGY
 (Chemical Engineering)

Time: 2 hrs

Maximum: 50 Marks

The figures in the right hand margin indicate marks.

PART – A: (Multiple Choice Questions)

(1 x 10 = 10 Marks)

- Q.1. Answer ALL questions [CO#] [PO#]
- a. Catalytic ammonia synthesis reaction as in Haber's process is [CO1] [PO1]
 (i) Endothermic (ii) Exothermic
 (iii) Irreversible (iv) None of these
- b. The most suitable fertilizer for accelerating seeding or fruit formation in later stages of plant growth is _____ fertilizer. [CO1] [PO1]
 (i) Nitrogenous (ii) Phosphatic
 (iii) Potassic (iv) None of these
- c. With increases in pressure, the conversion of Ammonium carbamate into urea _____ [CO1] [PO1]
 (i) Increases (ii) Decreases
 (iii) Remains unaltered (iv) Can either increase or decrease depends on biuret content
- d. Triple superphosphate is made by reacting phosphate rock with _____ acid. [CO1] [PO1]
 (i) Phosphoric (ii) Nitric
 (iii) Sulphuric (iv) Hydrochloric
- e. An increase in the NH_3/CO_2 ratio in urea manufacture results in [CO1] [PO1]
 (i) Increased degree of conversion of CO_2 to urea (ii) Decreased degree of conversion of NH_3 to urea
 (iii) Decreased yield of urea (iv) Decreased specific volume of molten mass
- f. Heating of coke, sand & phosphate rock in an electric furnace is done for the manufacture of [CO1] [PO1]
 (i) Phosphoric acid (ii) Superphosphate
 (iii) Phosphorous (iv) Triple superphosphate
- g. Which of the following is the costliest method for commercial production of hydrogen for ammonia synthesis? [CO1] [PO1]
 (i) H_2 separation from coke oven gas (ii) Steam reforming of naphtha
 (iii) Cracking of natural gas (iv) Electrolysis of water
- h. Bio-fertilizers are cheaper, renewable and pollution free. They improve the _____ of the soil. [CO1] [PO1]
 (i) Nutrient supply (ii) Texture
 (iii) Water holding capacity (iv) All the above
- i. The essential ingredient of all the synthesis gas is [CO1] [PO1]
 (i) H_2 (ii) O_2
 (iii) CO_2 (iv) N_2
- j. Phosphatic fertilizer is graded based on its _____ content. [CO1] [PO1]
 (i) P_2O_3 (ii) PCl_5
 (iii) P_2O_5 (iv) H_3PO_4

PART – B: (Short Answer Questions)**(2 x 5 = 10 Marks)**Q.2. Answer ALL questions

| | [CO#] | [PO#] |
|--|-------|-------|
| a. What are the different plant nutrients required for a plant growth? | CO1 | PO1 |
| b. Define Natural inorganic fertilizer. | CO2 | PO1 |
| c. Define Artificial Fertilizer. | CO1 | PO1 |
| d. Write the different mineral forms of Rock Phosphate. | CO3 | PO1 |
| e. Write the storage and handling practices for Ammonia. | CO4 | PO1 |

PART – C: (Long Answer Questions)**(6 x 5 = 30 Marks)**Answer ANY FIVE questions

| | Marks | [CO#] | [PO#] |
|---|-------|-------|-------|
| 3. Explain the type of Fertilizers. Also discuss the various types of elements essential for plants growth. | (6) | CO2 | PO1 |
| 4. Distinguish between Chemical fertilizer and Organic Manure. | (6) | CO1 | PO1 |
| 5. With all possible reactions, discuss in detail about Haber process for the production of Liquid Ammonia. | (6) | CO3 | PO2 |
| 6. Discuss the production of ammonium nitrate from proper feedstocks. | (6) | CO3 | PO2 |
| 7. Explain the production and storage of Single super Phosphate. | (6) | CO4 | PO1 |
| 8. Explain the manufacturing of Potassium Sulphate. | (6) | CO3 | PO2 |
| 9. Discuss the various grade of NPK fertilizers produced in India. | (6) | CO3 | PO1 |
| 10. With a neat flow sheet, discuss the production of Mono Ammonium Phosphate. | (6) | CO3 | PO2 |

--- End of Paper ---