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B.E. / B.TECH. DEGREE EXAMINATIONS, DEC 2019

Seventh Semester

CH16007 – FERTILIZER TECHNOLOGY*(Chemical Engineering)***(Regulation 2016)****Time: Three Hours****Maximum : 100 Marks**Answer **ALL** questions**PART A - (10 X 2 = 20 Marks)**

		CO	RBT
1.	With some examples, explain micro nutrients and macro nutrients.	1	R
2.	List the steps to be followed to eliminate biuret formation in urea synthesis.	3	U
3.	Write the chemical reactions involved in the manufacture of ammonium sulphate.	2	AP
4.	Find the mass of Phosphorous present in 5:4:2 NPK Fertilizer of 300g(60).	1	AP
5.	Mention the two grades of ammonium phosphate and write their nitrogen and P ₂ O ₅ content.	3	R
6.	Suggest some ways to recover potassium from mixed salts.	2	AN
7.	List the grades of Potassium chloride based on its size.	1	U
8.	Name the process which transforms fine powder to free-flowing particles and write the classification.	3	AN
9.	Write any four characteristics of slow release fertilizers.	4	U
10.	How does overuse of fertilizers affect the environment?	4	U

PART B - (5 X16 = 80 Marks)

11. (a) (i) Write down the similarity and dissimilarity between granulation and prilling process. **(8)** **1** **AN**
- (ii) Enumerate the properties, storage, handling and applications of ammonium nitrate. **(8)** **1** **R**

(OR)

- (b) (i) State the classification of fertilizers. Explain the role of various elements which are involved in plant growth. **(10)** **1** **AN**
- (ii) Reason out the need for neem coated urea and list their advantages. **(6)** **1** **AN**

12. (a) Reason out why chambers process is replaced by contact process to produce sulphuric acid. Explain the process description with major engineering problems associated with its manufacture. **(16) 2 AN**

(OR)

- (b) (i) Differentiate between Rhenania and Fused magnesium phosphate. **(6) 2 U**
- (ii) Compare the production of Super phosphate and triple super phosphate. **(10) 2 U**
13. (a) (i) Discuss the physical, chemical properties and applications of potassium chloride in detail. **(6) 2 R**
- (ii) Briefly discuss the separation of potassium chloride from sodium chloride by Leaching and flotation process. **(10) 2 U**

(OR)

- (b) Identify the fertilizer which could supply the essential nutrients of Potassium, Magnesium and Sulphur to plants from a single source and describe the flowsheet for the same. **(16) 2 AN**
14. (a) List the NPK grades of commercial fertilizers and express the concentration of nitrogen, phosphorous and potassium by weight for 19-50-20 fertilizer? Also label a fertilizer named Sylvite which has a pure potassium chloride in it. **(16) 3 AP**

(OR)

- (b) Develop a flowsheet for the manufacture of NPK fertilizers using ODDA process and discuss the major engineering problems associated with its manufacture. **(16) 3 AP**
15. (a) Justify the need for synthetic fertilizers and discuss the development and consumption of fertilizers in India. **(16) 4 AN**

(OR)

- (b) Write a short note on **(16) 4 U**
- a) Biofertilizers (3)
 - b) Controlled release fertilizers (3)
 - c) Fluid fertilizers (10)