QPC: RJ18001155 AR - 18 Reg. No.

GIET MAIN CAMPUS AUTONOMOUS GUNUPUR – 765022

B. Tech Degree Examinations, June – 2021

(Sixth Semester)

**BCHPE6040– FERTILIZER TECHNOLOGY**

(Chemical Engineering)

Time: 2 hrs Maximum: 50 Marks

**Answer ALL Questions**

**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. | Which is /are the primary nutrients? | | CO1 | PO1 |
| | (i)Nitrogen | (ii) Phosphorous | | |
| | (iii) Potassium | (iv) All the above | | |
| b. | The partial oxidation gasification is a non-catalytic reaction that takes place at elevated pressures up to ____ bar. | | CO1 | PO1 |
| | (i) 80 | (ii) 200 | | |
| | (iii) 300 | (iv) 400 | | |
| c. | Process for manufacturing of ammonia comprises of _____step(s). | | CO2 | PO1 |
| | (i) Raw Gas Preparation | (ii) Purification | | |
| | (iii) Ammonia synthesis | (iv) All the above | | |
| d. | In high temperature shift conversion process the catalyst used is _____. | | CO2 | PO1 |
| | (i) Platinum | (ii) Carbon | | |
| | (iii) Chromia | (iv) Chlorine | | |
| e. | What is the percentage of Nitrogen in Urea? | | CO2 | PO1 |
| | (i) 32 | (ii) 46 | | |
| | (iii) 63 | (iv) 78 | | |
| f. | The raw materials are required to produce Single super phosphate are _____and _____. | | CO3 | PO1 |
| | (i) Rock Phosphate, Sulphuric Acid | (ii) Potassium, Sulphuric Acid | | |
| | (iii) Rock Phosphate, Nitric Acid | (iv) Potassium, Nitric Acid | | |
| g. | Potassium Chloride (KCl) is called Muriate of Potash (MOP)in the fertilizer grade contains about _____of plant food as $K_2O$. | | CO3 | PO1 |
| | (i) 30 % | (ii) 60 % | | |
| | (iii) 50 % | (iv) 80 % | | |
| h. | Diammonium phosphate fertilizer with grade _____. | | CO3 | PO1 |
| | (i) 18:40:0 | (ii) 18:46:6 | | |
| | (iii) 18:46:0 | (iv) 18:46:20 | | |
| i. | Mono-ammonium phosphate is made by reacting ammonia with_____, centrifuging and drying in a rotary dryer. | | CO3 | PO1 |
| | (i) Phosphoric acid | (ii)Sulphuric Acid | | |
| | (iii) Nitric Acid | (iv)Naptha | | |
| j. | A mixture of phosphate rock, _____ is heated in an electric furnace to produce phosphorous. | | CO3 | PO1 |
| | (i) ) Salt & coke | (i) ) Sand & coke | | |
| | (iii) coal | (iv) coke | | |

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

| Q.2. Answer ***ALL*** questions | [CO#] | [PO#] |
|---|---|---|
| a. Write any two micronutrients that are essential for plants. | CO1 | PO1 |
| b. Write the composition of Coke Oven Gas. | CO2 | PO1 |
| c. Write the raw materials needed for production of single super phosphate. | CO3 | PO2 |
| d. How Potassium chloride can be stored? | CO4 | PO1 |
| e. What is complex fertilizer? | CO3 | PO4 |

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

| Answer ***ANY FIVE*** questions | Marks | [CO#] | [PO#] |
|---|---|---|---|
| 3. What is the necessity of manufacturing different grades of fertilizers? Explain in details with suitable examples. | (6) | CO1 | PO1 |
| 4. Classify different types of fertilizers with suitable examples. | (6) | CO1 | PO1 |
| 5. With process flow diagram, describe any one method of production of ammonia synthesis gas. | (6) | CO2 | PO3 |
| 6. With process flow diagram, describe the method of production of Ammonium Sulphate. | (6) | CO2 | PO2 |
| 7. Explain the method of production, characteristics and storage of Single Super Phosphate. | (6) | CO2 | PO2 |
| 8. Explain the method of production, characteristics and storage of Triple Super Phosphate. | (6) | CO2 | PO2 |
| 9. Explain the method of production, characteristics and storage of DAP. | (6) | CO3 | PO3 |
| 10. With process flow diagram, describe the method of production of Nitro Phosphates. | (6) | CO3 | PO3 |

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