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Question Paper Code: 53904

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2019

Third Semester

Chemical Engineering

15UCH304-CHEMICAL PROCESS INDUSTRIES - I

(Regulation 2015)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

- The formula of baking soda is _____. CO1- R
(a) NaOH (b) NaHCO₃ (c) Na₂CO₃ (d) Na₂O
- Bleaching powder is prepared by passing _____. CO1- U
(a) Chlorine over slaked lime (b) Oxygen over slaked lime
(c) Carbon dioxide over slaked lime (d) Chlorine over quick lime
- The conversion of SO₂ to SO₃ is _____ reaction. CO2- U
(a) Reversible (b) Irreversible (c) Dynamic (d) Static
- The chemical formula of alum is _____. CO2- R
(a) K₂Al(SO₄)₂ (b) KAl(SO₄)₂ (c) KAl₂(SO₄)₂ (d) K₂Al₂(SO₄)₂
- The addition of gypsum to the cement in order to _____. CO3- R
(a) Prolong hydration (b) Increase strength after hydration
(c) Decrease heat of hydration (d) Reduce curing time
- The approximate composition of ordinary glass is _____. CO3- R
(a) Na₂O.CaO.SiO₂ (b) Na₂O.CaO.SiO₃ (c) Na₂CO₃.6SiO₂ (d) Na₂O.CaO.6SiO₂
- The byproduct of urea is _____. CO4- R
(a) Thiourea (b) Hydrazine (c) Ammonia (d) Biuret
- The reaction of dilute sulphuric acid with phosphate rock produces _____. CO4- R
(a) Phosphoric acid (b) Phosphorous acid
(c) Triple superphosphate (d) Superphosphate

9. The commercial fertilizers are available mostly in the form of _____ CO5- R
 (a) powder (b) lumps (c) granules (d) flakes
10. Organic farming is the technique of raising crops through _____. CO5- R
 (a) Manures (b) Resistant materials (c) Biofertilizers (d) All the above

PART – B (5 x 2 = 10 Marks)

11. Write the chemical name and chemical formula of bleaching powder. CO1-R
12. What are the major engineering problems involved in the production of sulphur from pyrites? CO2-Ana
13. Give a short note on constituents of varnishes. CO3-U
14. Bring out the chemical reactions involved in the manufacture of phosphoric acid. CO4-Ana
15. What are biofertilizers? CO5- R

PART – C (5 x 16= 80 Marks)

16. (a) (i) With a neat sketch of flow diagram, outline briefly the production of soda ash by Solvay process. CO1- U (10)
 (ii) Give a short account on the preparation of bleaching powder. CO1- U (6)
- Or
- (b) (i) Outline briefly the electrolytic process for the production of chlorine and caustic soda with a neat flow sheet. CO1- U (10)
 (ii) What are the various process involved in the production of sodium chloride? Explain briefly. CO1- U (6)
17. (a) (i) With a neat flow sheet, explain briefly the production of sulphuric acid by contact process involving raw materials, chemical reactions and process description. CO2- U (10)
 (ii) Mention a short note on various chemicals used as bleaching agents in the wastewater treatment plants. CO2- U (6)
- Or
- (b) (i) Describe briefly the production of hydrochloric acid with its raw materials, chemical reactions involved and process description with a neat sketch. CO2- U (10)
 (ii) How will you recover Sulphur from polluting industries? Explain. CO2- U (6)

18. (a) (i) Explain briefly the raw materials and process description involved in the manufacture of Portland cement with a neat flow diagram. CO3- U (10)
- (ii) Discuss briefly the various constituents and functions of paints. CO3- U (6)
- Or
- (b) (i) With a neat sketch, explain briefly the production of glass by tank furnace method. CO3- U (10)
- (ii) Classify the types of refractories and give a brief note on it. CO3- U (6)
19. (a) Outline briefly the manufacture of urea from ammonium carbamate and production of synthetic ammonia with a neat flow sheet. CO4- U (16)
- Or
- (b) Describe briefly the production of Phosphate rock beneficiation and phosphoric acid with a schematic diagram. CO4- U (16)
20. (a) (i) Discuss the raw materials, chemical reaction and process description involved in the manufacture of super phosphate and triple super phosphate. CO5- U (10)
- (ii) Give a short account on herbicides and pesticides. CO5- U (6)
- Or
- (b) Deduce the chemical reaction and explain briefly the production of ammonium nitrate and ammonium sulphate with a neat flow sheet. CO5- U (16)

