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**A Reg. No. :**

**Question Paper Code: 51007**

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2017

First Semester

Agriculture Engineering

15UCY107 - CHEMISTRY FOR AGRICULTURIST

(Regulation 2015)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

|  |  |  |  |  |  |  |  |  |  |  |  |  |
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| 1. | What is the shape of C2H4 molecules? | | | | | | | | | | CO1- R | |
|  | (a) Trigonal pyramidal | | | | (b) Trigonal planar | | | (c) T shaped | | | (d) None of these | |
| 2. | The bond order in H2 | | | | | | | | | | CO1- R | |
|  | (a) 1.0 | | | | (b) 0.5 | | | (c) 0.0 | | | (d) 2.0 | |
| 3. | What is the reason for adding buffer solution in EDTA  complexometric method? | | | | | | | | | | CO2- R | |
|  | (a) Maintain reaction rate | | | | | (b) Maintain Temperature | | | | | | |
|  | (c) Maintain pH | | | | | (d) Change of colour | | | | | | |
| 4. | Which compound is named as Calgon? | | | | | | | | | CO2- R | | |
|  | (a) Sodium Aluminate | | | | | (b) Sodium hexa meta Phosphate | | | | | | |
|  | (c) Sodium Alumino silicate | | | | | (d) Sodium biphosphate | | | | | | |
| 5. | During corrosion of iron in aqueous solution | | | | | | | | CO3- App | | | |
|  | (a) Corrosion occurs at cathode | | | | | | | | | | | |
|  | (b) Rust / corrosion product is deposited at anode | | | | | | | | | | | |
|  | (c) Corrosion occurs at anode and rust is also deposited at anode | | | | | | | | | | | |
|  | (d) Corrosion occurs at anode and rust is also deposited at cathode | | | | | | | | | | | |
| 6. | Pitting corrosion is an example for | | | | | | | | CO3- R | | | |
|  | (a) Dry Corrosion | | | | | (b) Corrosion by CO2 | | | | | | |
|  | (c) Corrosion by H2S | | | | | (d) Corrosion by H2 | | | | | | |
| 7. | According to public board administration classification, soils are divided into\_\_\_\_\_ \_primary groups. | | | | | | | | | | CO4- R | |
|  | (a) 5 | | (b) 6 | | | (c) 8 | | | | | (d) 7 | |
| 8. | Applying \_\_\_\_\_ to soil will increase its pH. | | | | | | | | | | CO4- R | |
|  | (a) Aluminium | | (b) Limestone | | | | (c) Gypsum | | | | (d) Sulfur | |
| 9. | Table sugar is which type of sugar? | | | | | | | | | | CO5- R | |
|  | (a) Fructose | | (b) Galactose | | | | (c) Glucose | | | | (d) Sucrose | |
| 10. | Which of the following is a secondary protein structure? | | | | | | | | | | CO5- R | |
|  | (a) Sulfide bond | | | (b) Beta pleated sheet | | | (c) Alpha Carbon | | | | (d) Peptide bond | |
|  |  | | |  | | |  | | | |  | |
|  | PART – B (5 x 2= 10 Marks) | | | | | | | | | | | |
| 11. | What is Pauli's exclusion principle? CO1-U | | | | | | | | | | | |
| 12. | Differentiate between hand and soft water. CO2 -R | | | | | | | | | | | |
| 13. | State Pilling Bedworth rule. CO3 -R | | | | | | | | | | | |
| 14. | Suggest the organic matter present in the soil? CO4 -U | | | | | | | | | | | |
| 15. | What is food preservators? Give example. CO5 -U | | | | | | | | | | | |
|  | PART – C (5 x 16= 80 Marks) | | | | | | | | | | | |
| 16. | (a) | (i) Distinguish between the ionic and covalent bond. | | | | | | | | | CO1-U | (8) |
|  |  | (ii) What is hybridisation? Explain the various types Explain the  various types with suitable examples. | | | | | | | | | CO1-U | (8) |
|  |  | Or | | | | | | | | |  |  |
|  | (b) | (i) On the basis of Molecular Orbital theory proves that the  molecule of oxygen is paramagnetic in nature. | | | | | | | | | CO1 -App | (8) |
|  |  | (ii) Explain the determination of lattice energy with the help of  Born-Haber's cycle. | | | | | | | | | CO1 -U | (8) |
|  |  |  | | | | | | | | |  |  |
| 17. | (a) | (i) Write a notes on complexometric titration. Explain the  estimation of hardness of water using EDTA. | | | | | | | | | CO2 -App | (10) |
|  |  | (ii) Discuss the principles and salient features of desalination of  water by electodyalysis. | | | | | | | | | CO2-U | (6) |
|  |  | Or | | | | | | | | |  |  |
|  | (b) | (i) “Zeolite is an ideal water softener”, support this statement  with explanation. | | | | | | | | | CO2-App | (8) |
|  |  | (ii) Describe the various methods of internal treatment of boiler  water. | | | | | | | | | CO2-U | (8) |
|  |  |  | | | | | | | | |  |  |
| 18. | (a) | (i) What is single electrode potential? Derive Nernst’s equation  for emf of a cell. | | | | | | | | | CO3 -R | (8) |
|  |  | (ii) Explain the mechanism of chemical corrosion with neat  diagram. | | | | | | | | | CO3 -U | (8) |
|  |  | Or | | | | | | | | |  |  |
|  | (b) | (i)What is cathodic protection? Explain the two methods of  cathodic protection against corrosion? | | | | | | | | | CO3- U | (8) |
|  |  | (ii) What is paint? What are the different constituents of paint and explain their functions? | | | | | | | | | CO3- R | (8) |
|  |  |  | | | | | | | | |  |  |
| 19. | (a) | (i) Explain the various sourses of oxidation and reduction in soil. | | | | | | | | | CO4- U | (8) |
|  |  | (ii) Describe briefly the various types of mineral materials in  detail. | | | | | | | | | CO4- U | (8) |
|  |  | Or | | | | | | | | |  |  |
|  | (b) | (i) Write short notes on  a) Buffering Capacity, b) Soil acidity, c) Lime content in soil | | | | | | | | | CO4- U | (12) |
|  |  | (ii) Discuss the redox properties of soil | | | | | | | | | CO4- U | (4) |
|  |  |  | | | | | | | | |  |  |
| 20. | (a) | (i) Enumerate the principles of Food Chemistry? | | | | | | | | | CO5- U | (8) |
|  |  | (ii) Write short notes on  (a) Vitamins and (b) Flavouring reagents of food. | | | | | | | | | CO5- U | (8) |
|  |  | Or | | | | | | | | |  |  |
|  | (b) | (i) Discuss the manufacturing of ethanol by fermentation  method. | | | | | | | | | CO5- U | (8) |
|  |  | (ii)What are food resources and justify their impacts in  agriculture and overgrazing. | | | | | | | | | CO5- U | (8) |