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Question Paper Code: 51007

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

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)

1. An electro positive element will combine with electro negative element to form CO1-U
(a) Ionic Bond (b) Covalent Bond (c) Metallic Bond (d) Hydrogen Bond
2. Which species contains a sp^2 -hybridized atom? CO1-U
(a) BeH_2 (b) BH_3 (c) NH_3 (d) H_3O^+
3. Hardness in water is expressed in forms equivalent of CO2- R
(a) $CaCl_2$ (b) $MgCl_2$ (c) $CaCO_3$ (d) $MgCO_3$
4. Semi-permeable membrane is selective membrane which does not permit the passage of dissolved _____ particles. CO2- R
(a) Solvent (b) Solute (c) Anhydrous (d) Saturated
5. Which of the following metal protects itself forming a positive layer of its own oxide? CO3-R
(a) Pt (b) Au (c) Fe (d) Al
6. Corrosion of zinc can be minimized by increasing the pH to CO3-U
(a) 9 (b) 10 (c) 11 (d) 5
7. Which one of the following refers to the nutrient-holding ability of the soil? CO4-U
(a) alkalinity (b) Cation exchange capacity
(c) available Water Capacity (d) Nutrient loading

8. When the rate of physical adsorption will increase? CO4-U
 (a) by reducing pressure (b) by increasing temperature
 (c) by reducing temperature (d) both (a) and (c)
9. Simplest carbohydrate is CO5- R
 (a) Glucose (b) Sucrose (c) Glycerldehyde (d) Maltose
10. Which of the following is an amino acid that is found in proteins? CO5- U
 (a) Adenosine (b) Adenine (c) Alanine (d) Linoleic acid

PART – B (5 x 2= 10 Marks)

11. State Pauli exclusion principle. CO1- R
12. Define soft water. CO2- U
13. What is corrosion inhibitor? Name any two inhibitors used to prevent corrosion. CO3- U
14. Write the types of minerals particles in soil. CO4- R
15. What are natural food preservatives? CO5- R

PART – C (5 x 16= 80 Marks)

16. (a) (i) Give an account of the different types of hybridization with suitable example CO1-U (8)
 (ii) Explain metallic bond on the basis of molecular orbital theory CO1-U (8)
- Or
- (b) (i) With a neat sketch, discuss the molecular orbital diagram for N₂ molecule. Calculate the bond order of it. CO1-U (8)
 (ii) State Fajan's rule. Explain the predictability of covalent or ionic bond and polarization concept using the rule. CO1-U (8)
17. (a) (i) Explain the electro dialysis process for Desalination of brackish water with a neat sketch CO2-U (8)
 (ii) Illustrate the demineralization process for the Purification of water CO2-U (8)
- Or
- (b) (i) Explain the ion-exchange process of water softening. Write its advantages and disadvantages of the process. CO2-U (10)
 (ii) Discuss the desalination of brackish water using reverse osmosis method. CO2-U (6)

18. (a) (i) Write the expression for Nernst equation with its significance CO3- Ana (8)
(ii) What type of Corrosion occur the following cases? CO3- Ana (8)
- (a) Bolt Joint & Reverts
(b) Buried iron pipe lines
(c) Metallic articles completely immersed in water
(d) Window grill
- Or
- (b) (i) Discuss mechanism of Wet Corrosion CO3- U (8)
(ii) Explain how corrosion control can be brought about by sacrificial anodic method . CO3- U (8)
19. (a) (i) State and briefly explain four factors affecting Cation Exchange Capacity of a soil. CO4- Ana (8)
(ii) What is surface charge of minerals? and explain the two types of surface charge. CO4-U (8)
- Or
- (b) (i) What is soil acidity? Discuss briefly the causes, effects and management of soil acidity. CO4-U (8)
(ii) Explain how pH effects redox potential of soil. CO4-U (8)
20. (a) (i) Write a brief note on lipids and protein CO5-U (8)
(ii) How ethanol is manufactured from starch by fermentation method CO5-U (8)
- Or
- (b) (i) Describe the changes caused by modern agriculture on food resources CO5-U (8)
(ii) Describe briefly role of vitamins on human health CO5-U (8)

