A **Reg. No. :** | | | | | | | | | | |

Question Paper Code: 51005

B.E. / B.Tech. DEGREE EXAMINATION, DEC 2021

First Semester

Computer Science and Engineering

15UCY105 - APPLIED CHEMISTRY

(Common to EEE, ECE, EIE ,IT and Biomedical Engineering)

(Regulation 2015)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. Arrange the covalent bond configurations sp^3-sp^3, sp^2-sp^2 and sp-sp in increasing order of strength. CO1- R

   (a) sp^3-sp^3 < sp-sp < sp^2-sp^2 (b) sp^2-sp^2< sp^3-sp^3 < sp-sp

   (c) sp^3-sp^3 < sp^2-sp^2 < sp-sp (d) sp-sp < sp^2-sp^2 < sp^3-sp^3

2. The bond order in oxygen is _____. CO1- R

   (a) 1 (b) 2 (c) 3 (d) 4

3. Dry corrosion is a process of contact of two metals CO2- R

   (a) Indirectly (b) Directly (c) Oppositely (d) Reversibly

4. Using the data given below find out the strongest reducing agent. CO2- R

   $E^-Cr_2O_7^{2-}/Cr^{3+}$ = 1.33V, E^-Cr^{3+}/Cr = - 0.74V, E^-Cl_2/Cl^- = 1.36V, $E^-MnO_4^-/Mn^{2+}$ = 1.51V.

   (a) Cl^- (b) Cr (c) Cr^{3+} (d) Mn^{2+}

5. Primary batteries are examples of _____. CO3- R

   (a) Reversible cells (b) Fuel cells (c) Sensors (d) Irreversible cells

6. In ion – selective electrodes the change in p^H is sensed by CO3- R

   (a) pellet electrode (b) reference electrode

   (c) glass membrane (d) glass electrode

7. What is the range of visible region? CO4- R

(a) 200-400 nm (b) 400-1000 nm (c) 400-850 nm (d) 400-750 nm

8. Which of the following transitions is the highest energy transition? CO4- R

(a) n to σ^* (b) n to π^* (c) σ to σ^* (d) π to π^*

9. The number of boding sites in a monomer is referred to as its CO5- R

(a) functionality (b) tacticity (c) Co-polymers (d) degree of polymerisation

10. The fibre which is made from acrylonitrile as monomer CO5- R

(a) Rayon (b) Acrylic fibre (c) Nylon (d) PVC

PART – B (5 x 2= 10 Marks)

11. Distinguish between ionic compounds and covalent compounds. CO1- R

12. Identify the types of corrosion in the following and explain the mechanism (i) Iron knife with a wooden handle (ii) Welded stainless steel parts CO2- R

13. Differentiate primary cells and secondary cells CO3- R

14. A solution of thickness 3 cm transmits 30% of indcident light. Calculate the concentration of the solution, given extinction Co efficient $\in$= 4,000 $dm^3 mol^{-1} cm^{-1}$ CO4- App

15. Give the synthesis and uses of Nylon 66 CO5- R

PART – C (5 x 16= 80 Marks)

16. (a) What do you mean by hybridization? Explain with diagram the formation of Oxygen (O_2) and Hydrogen (H_2) using molecular orbital theory. CO1- U (16)

Or

(b) Explain the concept of bonding in a Homo and hetero diatomic molecule using MO Theory CO1- U (16)

17. (a) Describe in detail the measurement of single electrode potentially Poggendroff's method. CO2- U (16)

Or

(b) How are metals protected against corrosion by modifying the metal and the environment? Discuss in detail. CO2- U (16)

18. (a) (i) Explain H_2-O_2 fuel cell. Give its merits and demerits CO3- U (8)

(ii) What are chemically modified electrodes? Explain their types. CO3- U (8)

Or

	(b)	Describe the construction and working of lead acid storage battery. Compare the lead acid storage battery with that of the fuel cell.	CO3- U	(16)
19.	(a)	Summarize the working principles of thermo gravimetric analysis	CO4- U	(16)
		Or		
	(b)	(i) Explain with a schematic diagram the working of Differential Scanning Calorimetry (DSC). List the merits of DSC.	CO4- U	(8)
		(ii) Explain the thermo gravimetric analysis of any one chemical compound with neat block diagram.	CO4- U	(8)
20.	(a)	(i) Discuss the methods available in chemical and electrochemical doping of conducting polymer in detail	CO5- U	(8)
		(ii) What is OLED? Explain its structure, advantages and disadvantages of OLED.	CO5- U	(8)
		Or		
	(b)	What are liquid crystals? Discuss the applications of liquid crystals in the field of electronics.	CO5- U	(16)

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