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

Question Paper Code: R1Y04

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2024

First Semester

Electrical and Electronics Engineering

R21UCY105–APPLIED CHEMISTRY

(Common to ECE, BT, BME branch)

(Regulations R2021)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. The shape of Ethylene is _____ CO1-U

   (a) Trigonal planar (b) Spherical (c) Linear (d) Tetrahedron

2. The lowest energy orbital is CO1-U

   (a) p-orbital (b) d-orbital (c) s-orbital (d) f-orbital

3. Which of the following salt is responsible for permanent hardness CO1- U

   (a) $CaSO_4$ (b) $Mg(HCO_3)_2$ (c) NaCl (d) $CaCO_3$

4. The color of EBT indicator is _____ CO1- U

   (a) Steel blue (b) Steel green (c) Wine red (d) Violet

5. Liquid crystal exhibit_____ CO1- U

   a) liquid phase (b) gaseous phase (c) mesophase (d) solid

6. The molecules are orderly arranged in CO1- U

   (a) pure solid crystals (b) pure liquids (c) gases (d) none of the above

7. Example of Pesticide CO1- U

   (a) DDT (b) ATP (c) ADP (d) PVC

8. ----------Toxic metals found in food and drinking water CO1- U

(a) Pb (b) As (c) Cd (d) All the above

9. The electrolytic solution in H_2-O_2 fuel cell is_____ CO1- U

(a) KOH (b) H_2SO_4 (c) MnO_2 (d) liquid metal

10. Example for primary battery is _____ CO1- U

(a) H_2-O_2 fuel (b) dry cell (c) Lithium ion battery (d) none of these

PART – B (5 x 2= 10 Marks)

11. State Pauli's Exclusion principle CO1- U

12. Write the salts of responsible for non-carbonate hardness. CO1- U

13. Comment the Shape memory alloys. CO1- U

14. Explain the acid baths method of e-waste disposal. CO1- U

15. Differentiate between the primary and the secondary battery CO4-AP

PART – C (5 x 16= 80 Marks)

16. (a) (i) State Aufbau principle. Explain the order of filling of orbital with neat diagram. CO1- U (8)

(ii) Based on Aufbau principle, Write electronic configuration of the following elements (a) F (b) Cl (c) C (d) Cr CO1- U (8)

Or

(b) What are the postulates of valence bond theory? Discuss the SS, SP and PP overlapping of orbitals using valence bond theory. CO1- U (16)

17. (a) Analyze the hardness of well water by complexometric titration. CO5- Ana (16)

Or

(b) Identify the method for the removal of cations and anions of hard water? Discuss the various steps involved with suitable diagram. CO5- Ana (16)

18. (a) What is meant by smart material? Explain the different type of smart materials. CO2- U (16)

Or

(b) What is OLED? Explain the schematic of OLED device and explain the working principle. CO2- U (16)

19. (a) Write e-waste management techniques known to you. Briefly CO2- U (16)

explain three methods of e-waste disposal.

Or

	(b)	Outline the concept and importance of Green chemistry	CO2- U	(16)
20.	(a)	Compare the dry cell and fuel battery with neat diagram. Mention its disadvantages.	CO4-AP	(16)

Or

	(b)	Robert residing the place where the temperature around 25°C. He need 12V electricity for his two wheeler, what kind of battery he need to construct and discuss their components, construction and mechanism.	CO4-AP	(16)