

A

Reg. No. :

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Question Paper Code: R1Y05

B.E. / B.Tech. DEGREE EXAMINATION, DEC 2025

First Semester

Electrical and Electronics Engineering

R21UCY105–APPLIED CHEMISTRY

(Common to ECE, BT & BME Engineering 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) $\text{Mg}(\text{HCO}_3)_2$ (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 H₂-O₂ fuel cell is _____ CO1- U
 (a) KOH (b) H₂SO₄ (c) MnO₂ (d) liquid metal
10. Example for primary battery is _____ CO1- U
 (a) H₂-O₂ fuel (b) dry cell (c) Lithium ion battery (d) none of these

PART – B (5 x 2= 10 Marks)

11. What is Van der Waals force of attraction? 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-App

PART – C (5 x 16= 80 Marks)

16. (a) Discuss the hybridization involved in methane, acetylene and ethylene. CO1- U (16)
- Or
- (b) Write a brief outline of the postulates of valence bond theory. CO1- U (16)
 Discuss ss, sp and sp overlapping using valence bond theory.
17. (a) A hotel tea shop boiler gets more corroded due to the continuous usage of hard water. So, how you prevent that boiler by using internal conditioning methods. CO5- Ana (16)
- Or
- (b) How do you extract desalinated water from brackish water using membrane? Explain the working principle and procedure involved. 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 explain three methods of e-waste disposal. CO2- U (16)
- Or
- (b) Outline the concept and importance of Green chemistry. CO2- U (16)

20. (a) How do you produce electric energy to supply H_2 and O_2 gas in fuel cell with 25 % KOH as electrolyte. CO4-App (16)

Or

(b) Ramu want to produce the electric power and water without damaging environment. In order to protect the environment, what kind of cell he need to construct and explain their reactions occur at electrodes. CO4-App (16)

