

 (Affiliated to University of Mumbai)		End Semester Examination (R-24) SH 2025 Answer Key with marking scheme	
Branch: IT/AIML/AIDS/CSE-IOT		Course: Applied Chemistry	
Year/ Semester: SH2025/I		Course code: FEC1022	
Time: 03 hours		Marks: 80	
			Marks
Q. 1	Attempt any FOUR. (All questions carry equal marks)		
A.	Diagram.....2M Explanation.....3M		5
B.	Minimum 5 Difference.....5M		5
C.	2 Kg alloy contains 400g Cd and 1600g Bi.....1M Eutectic system contains, Cd=50% and Bi=50%.....1M Hence, corresponding to 200g Cd, mass of Bi= 400 x 50/50= 400g.....2M Hence, Total mass of eutectic in 2Kg of alloy= 400g + 400g= 800g1M		5
D.	Relative areas of anode and cathode (explanation).....2.5M Purity of metal (explanation with example)2.5M		5
E.	Definition of Biodiesel.....1.5M Synthesis (explanation + Reaction)2M Applications (min 3)1.5M		5
F.	Definition of Composites2M Classification of Composites.....3M		5
Q.2	Attempt any FOUR. (All questions carry equal marks)		
A.	i) Diagram2 M Types of CNTs.....2M Applications...1M		5
	ii) Definition of Optical Fibre.....1.5M Properties 2M Applications (min 4) 1.5M		5
B.	i) Definition of Tg.....1M Diagram.....2M Explanation2M		5
	ii) $M_n = \frac{N_1M_1 + N_2M_2 + N_3M_3}{N_1 + N_2 + N_3}$0.5M $M_n = \frac{5 \times 15000 + 3 \times 30000 + 2 \times 60000}{5 + 3 + 2}$0.5M $M_n = 28,500$1M Mw: Formula + substitution.....1M $M_w = 38,684$1M PDI= 1.35.....1M		5
C.	i) Diagram -2M Explanation of all the curves and points in the phase diagram- 3M		5
	ii) Heat resisting steel.....2.5M Shock-resisting steel 2.5M		5
D.	i) Diagram.....2M Explanation with reactions.....3M		5

	ii) Minimum 5 difference5M	5
E.	i) Formula of HCV -----1M Substitution-----0.5M Answer-----1M [HCV= 7629.7 kcal/kg] Formula of LCV -----1M Substitution-----0.5M Answer-----1M [LCV= 7392.01 kcal/kg] ii) What are Electrochemical sensors.....1M Working3M Applications (min 4)1M	5 5
F.	i) Explanation.....3M Diagram.....2M ii) Definition.....1M Classification with explanation4M	5 5
Q.3	Attempt any FOUR. (All questions carry equal marks)	
A.	Any 02 properties2.5M each	5
B.	i) $P = 1, C = 2, F = 2 - 1 + 2 = 3$ (trivariant).....2M ii) $P = 2, C = 2, F = 2 - 2 + 2 = 2$ (bivariant).....2M iii) $P = 2, C = 2, F = 2 - 2 + 2 = 2$ (bivariant).....1M	5
C.	Use of corrosion inhibitors 2.5 M Explanation of proper designing with diagram.....2.5M	5
D.	Diagram.....2M Explanation.....3M	5
E.	What is H_2-O_2 fuel cell.....1M Working (Explanation + Diagram + Reactions)3M Applications.....1M	5
F.	Amount of air required= $100/23 [2.67C + 8H + S - O]$1M = $100/23 [2.67 \times 0.80 + 8 \times 0.10 + 0.02 - 0.05]$ kg.....1M = $100/23 [2.136 + 0.8 + 0.02 - 0.05]$ Kg = $100/23 [2.906]$ Kg = 12.63 Kg.....1M	5