

 SIES Graduate School of Technology RISE WITH EDUCATION NMACA+ (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.	What is graphene.....1M Properties.....2M Application.....2M		5
B.	Definition of Conducting Polymers-----1.5M Explanation of Types of CPs -----2M Applications (min 4) -1.5 M		5
C.	Definition of phase with 2 examples.....2.5M Definition of components with 2 examples.....2.5M		5
D.	What is wet corrosion.....1M Diagram-----1M Explanation with reactions-----3M		5
E.	Amount of air required= $100/23 [2.67C + 8H + S - O]$1M $=100/23 [2.67 \times 0.82 + 8 \times 0.06 + 0.01 - 0.04]$ kg.....1M $=100/23 [2.189 + 0.48+0.01 - 0.04]$ Kg.....1M $=100/23 [2.639]$ Kg $= 11.47$ Kg.....1M Volume of air required = $(11.47 \times 22.4)/28.949 = 8.87 \text{ m}^3$1M		5
F.	Definition of Particle-reinforced composites.....1.5M Explanation of types3.5M		5
Q.2	Attempt any FOUR. (All questions carry equal marks)		
A.	i) Definition of Fullerenes-1M Properties-2M Applications (min 4) -2M		5
	ii) Def of nanomaterial-2M Properties -1.5M Explanation-1.5M		5
B.	i) $M_n = \frac{N_1M_1+N_2M_2+N_3M_3}{N_1+N_2+N_3}$0.5M $M_n = \frac{100 \times 20000 + 200 \times 10000 + 500 \times 50000}{100+200+500}$0.5M $M_n = 36250$1M $M_w = \text{Formula} + \text{substitution}$1M $M_w = 48161$1M $PDI = 1.32$1M		5
	ii) Definition1.5M Explanation3.5M		5
C.	i) a) $P = 1, C = 2, F = 2-1+2 = 3$ (Trivariant).....2M b) $P = 2, C = 1, F = 1-2+2 = 1$ (Univariant).....1M c) $P = 2, C = 2, F = 2-2+2 = 2$ (bivariant).....2M		5
	ii) Diagram -1.5M		5

	Explanation of all the curves and points in the phase diagram- 3.5M	
D.	i) Temperature.....1M Humidity.....1M pH.....1M Nature of oxide film.....2M ii) Explanation of impressed current method – 2M Diagram – 1.5 M Application – 1.5 M	5 5
E.	i) Formula of HCV -----1M Substitution-----0.5M Answer-----1M [HCV= 6459 kcal/kg] Formula of LCV -----1M Substitution-----0.5M Answer-----1M [LCV= 6194.85 kcal/kg] ii) Diagram.....1.5M Explanation.....2.5M Application.....1M	5 5
F.	i) Dispersed phase.....1M Explanation with examples of dispersed phase.....4M ii) Definition of Composites2M Classification of Composites.....3M	5 5
Q.3	Attempt any FOUR.	
A.	Diagram 1.5M Explanation.....2.5M Application.....1M	5
B.	Any 02 properties2.5M each	5
C.	1kg alloy contains 730g Sn and 270g Pb.....1M Eutectic system contains, Sn=64% and Pb=36%.....1M Hence, corresponding to 270g Sn, mass of Pb= $270 \times \frac{64}{36} = 480$ g.....2M Hence, Total mass of eutectic in 1Kg of alloy= $480\text{g} + 270\text{g} = 750$ g1M	5
D.	Composition, Properties and Uses of Duralumin.....2.5M Composition, Properties and Uses of Magnalumin.....2.5M	5
E.	Diagram.....2M Explanation.....3M	5
F.	Synthesis of power alcohol.....4M Application.....1M	5