

OSMANIA UNIVERSITY
FACULTY OF ENGINEERING
UNIVERSITY COLLEGE OF ENGINEERING (AUTONOMOUS)
B.E. (CIVIL/EEE/MECH & Mining) II - Semester (Main)
Examinations August/September 2022
ENGINEERING CHEMISTRY

Max. Marks : 70

Time : 3 hours

- Note :** i) Answer Question No. 1 (Compulsory) and Answer any four questions from the remaining questions (2 - 7).
ii) Answers must be written in same order as they occur in the Question Paper.
iii) Missing data, if any, may suitably be assumed.

	Marks	BT	CO
1. a) State reverse osmosis.	2	1	1
b) Differentiate between electrolytic and galvanic cells.	2	2	2
c) Find out the bond order and magnetic behavior of N_2 molecule.	2	3	3
d) What are elastomers? Give an example.	2	1	4
e) Write the overall reaction of Ni-Cd battery.	2	1	5
f) Define co-polymer with an example.	2	1	4
g) What is meant by solar cells.	2	1	5
2. a) Define scales. Explain the prevention of scales.	7	5	1
b) What is electrochemical corrosion. Discuss the mechanism of electrochemical corrosion.	7	5	1
3. a) Derive Nernst equation. Standard electrode potential of Zn^{+2} is (-0.76V). Calculate the electrode potential of 2M Zn^{+2} solution at 300K.	7	5	2
b) Define cyclic process. Evaluate the expression for the determination of efficiency of heat engine by Carnot cycle.	7	5	2
4. a) Explain the Crystal Field Splitting of d-orbital in tetrahedral complexes.	7	5	3
b) Discuss the applications of UV-Visible spectroscopy.	7	6	3
5. a) Define conducting polymers. Explain the various applications of conducting polymers.	7	5	4

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| b) | Define liquid crystals. Explain the classification of thermotropic liquid crystals in brief. | 7 | 5 | 4 |
| 6. a) | What are secondary batteries. Explain the reactions involved in Lead-Acid battery during charging and discharging. | 7 | 5 | 5 |
| b) | Discuss the synthesis of nanomaterials by Sol-gel method with a neat diagram. | 7 | 6 | 5 |
| 7. a) | What is meant by de-ionised water. Explain the preparation of de-ionised water by ion-exchange method. | 7 | 5 | 1 |
| b) | Discuss the magnetic properties of metal complexes from d^1 - d^5 systems. | 7 | 6 | 3 |

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