KLE Technological University
Creating Value
Leveraging Knowledge

Department of Chemistry

In Semester Assessment (ISA) - II

(P, Q & R Divisions)

Course: Engineering Chemistry		**Course Code: 15ECHB102**
Duration: 75 Minutes.	**Date: 25-07-2022** **Time: 10:00 AM to 11.15 AM**	**Max. Marks:40**

Note: ***Answer any two full questions***

Q. No	Questions	Marks	CO	BL	PO	PI Code
1 a.	Explain with neat diagram, the manufacture of electronic grade silicon by CVD process with relevant reactions.	7	5	L2	1	1.2.2
b.	Discuss the electroplating process of gold by using acid cyanide bath and mention its applications.	7	4	L2	1	1.2.2
c.	A Silicon crystal is to be pulled from the melt by Czhochralski process and doped with Phosphorous. If silicon weighs 25 kg, how many milligrams of phosphorous should be introduced to achieve a donor concentration of 3 x 10^{15} atoms/cm^3 during initial growth? Given: K_0 for 'P' in Silicon is 0.32; Atomic weight of 'P' = 30.97 g/mole; Density of Si is 2.33 g/cm^3; Avogadro number = 6.023 x 10^{23} atoms/mole.	6	5	L3	1	1.2.1
2 a.	Describe the fabrication process of silicon wafers by thermal oxidation with relevant reactions?	7	5	L2	1	1.2.2
b.	Explain the process of liquid crystal display with respect to 176.	7	6	L2	1	1.2.2
c.	What is throwing power? The throwing power of an electrolyte in a Haring Blum cell is 75%. In an experiment, 68 mg of the metal was deposited at the nearest cathode kept at a distance of 4.8 cm from the cathode. At what distance must the cathode be kept if the metal deposited on it is 64 mg?	6	4	L3	1	1.2.1
3 a.	Discuss in detail the process of Czhochralski crystal pulling technique in the production of single crystal silicon.	7	5	L2	1	1.2.2
b.	What are liquid crystals? Explain the classification of liquid crystals with example.	7	6	L2	1	1.2.2
c.	Determine the ratio of Si consumed to the thickness of grown SiO_2 layer over silicon wafer. Calculate the increase in thickness of Si wafer during the process of oxidation, if 88 Å thick silicon is used for the process. Given: Atomic weight of Silicon = 28.09 g/mol. Molecular weight of SiO_2 = 60.08 g/mol. Density of Si = 2.33 g/cm^3. Density of SiO_2 = 2.20 g/cm^3.	6	5	L3	1	1.2.1