Hall Ticket Number:

Code No. : 11316 S N

VASAVI COLLEGE OF ENGINEERING *(AUTONOMOUS)*, HYDERABAD

Accredited by NAAC with A++ Grade

B.E. I-Semester Supplementary Examinations, August-2023

Engineering Chemistry

(Common to EEE & ECE)

Time: 3 hours Max. Marks: **60**

*Note: Answer all questions from **Part-A** and any **FIVE** from **Part-B***

Part-A (10 × 2 = 20 Marks)

Q. No.	Stem of the question	M	L	CO	PO
1.	Define and write expression for specific and equivalent conductance.	2	1	1	1,2,12
2.	What are the electrode reactions of Calomel and Glass electrodes?	2	2	1	1,2,12
3.	Distinguish between reversible and irreversible cells. Give an example for each.	2	3	2	1,2,7,12
4.	What are the applications of phosphoric acid fuel cell and molten carbonate fuel cell?	2	1	2	1,2,7,12
5.	Define (i) Monomer (ii) Homo polymer and give an example for each.	2	1	3	1,2,7,12
6.	Summarize the preparation and any two applications of Aramid.	2	2	3	1,2,7,12
7.	Why nanomaterials differ from bulk materials?	2	3	4	1,2,7,12
8.	Define thermotropic and lyotropic liquid crystals.	2	1	4	1,2,7,12
9.	Write the principle involved in AFM.	2	2	5	1,2,12
10.	Illustrate any two applications of TGA.	2	2	5	1,2,12
	Part-B (5 × 8 = 40 Marks)				
11. a)	Discuss the principle of conductometric i) HCl Vs NaOH ii) CH_3COOH Vs NaOH titrations.	4	2	1	1,2,12
b)	Calculate the *p*H of a solution placed in quinhydrone half-cell coupled with a standard calomel half-cell. The emf of the cell is 0.15V at 298 K. $E^{\circ}_{Calomel} = 0.2415$ V and $E^{\circ}_{quinhydrone} = 0.6996$ V.	4	3	1	1,2,12
12. a)	Define and write expression for power density and energy density and mention their units.	4	1	2	1,2,7,12
b)	What are secondary batteries? Discuss about the construction and working of lead-acid battery.	4	3	2	1,2,7,12

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13. a)	Explain the concept of biodegradable polymer and write preparation and uses of poly lactic acid.	4	3	3	1,2,7,12
b)	Differentiate between addition and condensation polymerization with one example each.	4	2	3	1,2,7,12
14. a)	Explain sol-gel method for the synthesis of nanomaterials.	4	2	4	1,2,7,12
b)	Analyze the molecular ordering in liquid crystals.	4	3	4	1,2,7,12
15. a)	Construct an atomic absorption spectrometer and examine its applications.	4	3	5	1,2,12
b)	Develop the model of differential scanning calorimeter.	4	3	5	1,2,12
16. a)	Derive Nernst equation and write its applications.	4	2	1	1,2,12
b)	Construct a methanol-oxygen fuel cell and mention its applications.	4	2	2	1,2,7,12
17.	Answer any ***two*** of the following:				
a)	Describe carbon and glass FRCs	4	1	3	1,2,7,12
b)	Demonstrate the synthesis of carbon nanotubes by arc discharge method.	4	2	4	1,2,7,12
c)	Identify the limitations of optical microscopy and significance of de Broglie's equation.	4	3	5	1,2,12

M : Marks; L: Bloom's Taxonomy Level; CO; Course Outcome; PO: Programme Outcome

i)	Blooms Taxonomy Level – 1	20%
ii)	Blooms Taxonomy Level – 2	40%
iii)	Blooms Taxonomy Level – 3 & 4	40%

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