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Code No. : 12034 (D)

VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD**B.E. (CBCS) II-Semester Main Examinations, January-2021****Engineering Chemistry**

(Common to CSE & IT)

Time: 2 hours

Max. Marks: 60

*Note: Answer any NINE questions from Part-A and any THREE from Part-B***Part-A (9 × 2 = 18 Marks)**

Q. No.	Stem of the question	M	L	CO	PO
1.	The conductance of a weak electrolyte increases during the titration against strong base - justify	2	3	1	1
2.	Why the transport numbers of sodium in sodium chloride and sodium sulphate solutions different?	2	4	1	1
3.	Differentiate between reversible and irreversible cells.	2	3	2	1
4.	Insulator is placed between anode and cathode during the construction of lead acid battery-Reason	2	4	2	1,2
5.	What is doped conducting polymer? Give an example	2	1	3	1
6.	What is hetero chain polymer? Give an example	2	2	3	1
7.	Classify the composites.	2	1	4	1,12
8.	Give the differences between ultra and nano filtration.	2	2	4	1
9.	Define liquid crystal and mention its two advantages.	2	1	5	1,12
10.	What is Smectic liquid crystal?	2	2	5	1,12
11.	Why it is not possible to measure the isolated single electrode potential.	2	2	1	1
12.	Write the anodic and cathodic reactions of hydrogen-oxygen fuel cell?	2	1	2	1,12
Part-B (3 × 14 = 42 Marks)					
13. a)	Discuss the determination of transport number by Hittorf's method?	7	1	1	1
b)	A conductivity cell is filled with 0.01N solution of copper sulphate offers a resistance of 250 ohms at 25°C. Compute its specific, equivalent and molar conductance of the solution. (Cell constant of conductivity cell = 0.1 cm ⁻¹)	7	2	1	1,2
14. a)	What are secondary cells? Explain the construction and working of Ni-Cd battery. Explain the reactions in each of the cell during charging and discharging	7	3	2	1,7
b)	With the help of a suitable diagram explain the phosphoric acid fuel cell. What are the advantages of fuel cell?	7	4	2	1,7

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15. a)	Discuss the vulcanization of natural rubber and write its advantages over un vulcanized rubber.	7	1	3	1
b)	What are biodegradable polymers? Explain preparation and uses of poly lactic acid?	7	2	3	1,7,12
16. a)	How are composite materials manufactured using hand lay up method? Explain	7	1	4	1
b)	Explain the working principle of membranes. Discuss synthesis of polyphenyle oxide membrane.	7	2	4	1
17. a)	How are carbon nano tubes synthesized using arc discharge and laser ablation methods? Explain.	7	1	5	1,12
b)	What are Thermotropic and Lyotropic liquid crystals? Explain with an example.	7	2	5	1,12
18. a)	The EMF of the cell containing quinhydrone and calomel electrode is 0.264 V at 25°C. Write the cell representation and calculate pH of the solution. Potential of calomel electrode is 0.2422 V and quinhydrone is 0.6996 V.	7	3	1	1,2
b)	Discuss the construction of Li-V ₂ O ₅ battery. Explain the chemical reactions taking place at each of the cell.	7	4	2	1
19.	Answer any <i>two</i> of the following:				
a)	What is glass transition temperature? Explain its significance and the factors that influence glass transition temperature.	7	3	3	1
b)	Discuss the membrane applications in electro dialysis and reverse osmosis methods.	7	4	4	1
c)	Explain top down and bottom up approach for the synthesis of nano materials.	7	2	5	1,12

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

S. No.	Criteria for questions	Percentage
1	Fundamental knowledge (Level-1 & 2)	60
2	Knowledge on application and analysis (Level-3 & 4)	40
3	*Critical thinking and ability to design (Level-5 & 6) (*wherever applicable)	
