Code No. 3394 / S

FACULTY OF ENGINEERING & INFORMATICS

B.E. I-Semester (Suppl.) Examination, June / July 2017

Subject : Engineering Chemistry-I

Time : 3 hours **Max. Marks : 70**

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

PART – A (20 Marks)

1	State and explain First law of thermodynamics.	2
2	State Carnot theorem.	2
3	What is meant by the term eutectic?	2
4	State phase rule.	2
5	Calculate the carbonate and non-carbonate hardness of a sample of water in ppm containing : Ca $(HCO_3)_2$ = 8.1 mg.L^{-1} ; Mg $(HCO_3)^2$ = 7.3 mg.L-1 ; $Mgcl_2$ = 9.5 mg.L-1 ; $CaSO_4$ = 13.6 mg.L^{-1}.	2
6	Define the terms i) Scale and ii) sludge	2
7	Give one example each for Addition and Condensation polymers.	2
8	Write the structures of poly-acetylene and poly-aniline.	2
9	Define the terms i) Saponification number and ii) acid value	2
10	Explain the property of RUL in refractories.	2

PART – B (50 Marks)

11	a)	Calculate the maximum work done when 2 moles of an ideal gas expand isothermally and reversibly from a volume of 10 litres to a volume of 20 litres at 298k.	5
	b)	Explain the criteria for spontaneity of a process interms of entropy and free energy.	5
12	a)	What do you understand by the reduced phase rule equation? Discuss the use of the phase rule in Pattinson's process of disilverization of lead.	5
	b)	Define the terms i) Phase ii) component iii) degrees of freedom.	5
13	a)	Explain the procedure for the determination of Alkalinity of water.	5
	b)	Discuss the concept of break point chlorination.	5
14	a)	Explain the preparation, properties and applications of Nylon-6,6.	5
	b)	Differentiate between thermoplastic and thermosetting polymers.	5
15	a)	Classify lubricants and give one example each for various type of lubricants.	5
	b)	Write a note on the following properties of Refractories. i) Refractoriness ii) Thermal spalling	5
16	a)	Derive an expression for the efficiency of heat engine by using carnot cycle.	6
	b)	Discuss the ion-exchange method of softening hard water.	4
17	a)	Write a note on intrinsic conducting polymers	5
	b)	Explain the terms i) viscosity index ii) glazing	5

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