VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD
B.E. I Year I Semester Supplementary Examinations, June-2017

Engineering Chemistry -I

Time: 3 hours

Max. Marks: 50

Note: Answer ALL questions in Part-A and any FIVE from Part-B

Part-A (15 Marks)

1.	Why hydroxide and bicarbonate alkalinity does not exist together?	[1]
2.	What is hetero chain polymer? Give an example.	[1]
3.	What is intrinsic polymer?	[1]
4.	State First Law of Thermodynamics?	[1]
5.	Write the composition of LPG.	[1]
6.	The hardness of a water is 500 ppm. Calculate the concentration of Ca^{2+} ions.	[2]
7.	Distinguish between elastomers and plastics.	[2]
8.	Give the general characteristics of composites.	[2]
9.	What is the need of Second Law of Thermodynamics?	[2]
10.	What is the significance of knocking?	[2]

Part-B (5 × 7 = 35 Marks)

11. a) Illustrate break-point chlorination? What are its merits? [3]

    b) 20ml of 0.05 N hard water required 18.5ml of EDTA during the titration. 20ml of another [4] hard water required 22.5 ml of same EDTA. The same water sample after boiling and cooling required 14.5 ml of EDTA. Calculate temporary and permanent hardness of water sample.

12. a) Distinguish between addition and condensation polymerization with an example each. [4]

    b) What is natural rubber? Write its structure. Why is vulcanization required? [3]

13. a) Explain the mechanism of conduction in doped and undoped polyacytalene. [4]

    b) Discuss the failure of particle and fibre reinforced composites. [3]

14. a) Draw Carnot cycle and explain. [4]

    b) 5 moles of an ideal gas expand reversibly at a temperature of $50^{\circ}C$ by decreasing the [3] pressure from 10 atm to 2 atm. Calculate the work done.

15. a) What is biodiesel? Explain trans esterification. [3]

    b) Compute the Gross and Net calorific values of a fuel containing 76% C, 12% H, 4% N, [4] 2% S, 2% Ash and rest is Oxygen.

16. a) Discuss how hardness of water is determined by using EDTA. [4]

    b) Distinguish between thermoplastics and thermosets. [3]

17. Answer any *two* of the following: [7]
    a) What are carbon reinforced composites?
    b) Derive Gibbs-Helmholtz equation.
    c) How is quality of gasoline enhanced? Explain.

಴಴಴಴಴಴