VASAVI COLLEGE OF ENGINEERING *(Autonomous)*, HYDERABAD
B.E. I Year I-Semester (Old) Examinations, December-2016

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.	How many possible alkalis exists in water?	[1]
2.	What is co-polymer? Give an example.	[1]
3.	What is extrinsic polymer?	[1]
4.	Define thermodynamic reversible process?	[1]
5.	Write the composition of CNG.	[1]
6.	Why EDTA acts as only hexadentate ligand when it is bonded to Ca^{2+} ions? Write the structure of EDTA.	[2]
7.	What is vulcanization? Why is it required?	[2]
8.	Give the advantages of composite materials.	[2]
9.	Discuss the criteria of spontaneity in terms of entropy and free energy	[2]
10.	Distinguish between cetane and octane numbers.	[2]

Part-B (5 × 7 = 35 Marks)

11. a) Explain the effects of hard water when it is used in boilers. [3]

    b) 20 ml of water sample on titration with 0.05 N HCl using phenolphthalein indicator gave an endpoint at 6.5 ml of acid consumed and gave an endpoint at 10.5 ml of acid consumed using methyl orange as an indicator. Calculate the different types of alkalinity present in the water sample. [4]

12. a) Compare addition and condensation polymerizations. [3]

    b) Discuss the preparation methods of Buna-S, Butyl and Silicone rubber. [4]

13. a) Explain the mechanism of conduction in doped and un doped polyaniline. [4]

    b) Discuss the classification of composites and give examples. [3]

14. a) Derive Gibbs-Helmholtz equation and discuss its applications. [4]

    b) The free energy change accompanying a given process is -86 kJ at 298 K and -84 k J at 308 K. Calculate the change in enthalpy for the process at 303 K. [3]

15. a) What is the significance of proximate analysis. [4]

    b) Define GCV & NCV. Calculate NCV of a fuel containing 8% hydrogen when its GCV is 6436 Cal/gm. [3]

16. a) How is water softened by Reverse Osmosis method? Discuss its merits and demerits. [4]

    b) What are the applications for biodegradable polymers? [3]

17. Answer any *two* of the following: [7]
    a) What are the characteristics of composites?
    b) Prove that the entropy change during an irreversible process is always positive.
    c) What are catalytic converters? Explain.

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