Hall Ticket Number:

Code No.: 1114 O

VASAVI COLLEGE OF ENGINEERING *(Autonomous)*, HYDERABAD

B.E. I Year I-Semester (Old) Examinations, December- 2015

Engineering Chemistry-I

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

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

Part-A (10 X 2=20 Marks)

1. Choose the correct answer from the choices given below
   i. Calgon is added to hard water to prevent
      a. Corrosion
      b. Priming
      c. Foaming
      d. Scale formation

   ii. Butyl rubber is produced by co polymerization of
      a. Isobutene and chloroprene
      b. Isobutene &1,3- butadiene
      c. Isobutene & neoprene
      d. Isoprene & chloroprene

2. Differentiate between temporary and permanent hardness.

3. A sample of 10 liters hard water contains 14.6gms of magenisum bicarbonate and 9.5gms of magnesium chloride and 13.6gms of calcium sulphate. Calculate total hardness of water.

4. What are homo and copolymers. Give one example each.

5. Explain addition and condensation polymerisation with a suitable example.

6. What are composites? Give their classification with one example each.

7. Define entropy. Explain its physical significance.

8. Calculate maximum efficiency of a heat engine operating between 110^0 C and 25^0 C.

9. What are the requirements of a good fuel?

10. Distinguish between LPG and CNG.

Contd..2..

Part-B (5 X 10=50 Marks)

11.a) Explain the principle and method of determination of hardness of water by EDTA method. **6**

b) 100 ml of water sample required 5 ml of N/50Sulphuric acid for neutralization to phenolphthalein end point, another 15 ml of the same acid needed for further titration to methyl orange end point. Compute the type and amount of alkalinity. **4**

12. a) Define plastics ,elastomers and fibres ? Explain with examples. **3**

b) Describe preparation, properties and engineering applications of

i) Bakelite ii)Aramid **7**

13. a) Illustrate the mechanism of conduction in doped conducting polymers and write their applications. **6**

b) Assess the advantages and applications of composites? **4**

14. a) State First Law of Thermodynamics. What are its limitations? **4**

b) Derive Gibbs-Helmholtz equation. Discuss its applications? **6**

15. a) Discuss the significance of Proximate Analysis of coal. **4**

b) Compute the Gross and Net calorific value of coal sample containing 76% C, 3% O, 20% H ,0.5% S ,0.2%N, 0.3%Ash . **3**

c) Define octane and cetane numbers. **3**

16. a) Describe the principle and method of softening of water by Reverse Osmosis. **4**

b) Justify the need of vulcanization of natural rubber and discuss its mechanism. **6**

17. a) Write a note on biodiesel focusing on transesterification reaction. **6**

b) 5 moles of an ideal gas expands and reversibly from a volume of 1L to 10 L at 27^0 C . Calculate the change in entropy and free energy of the gas in joules. **4**

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