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Code No. : 11013 S

VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD
B.E. (CBCS) I-Semester (New) Supplementary Examinations, May/June-2018

Engineering Chemistry

Time: 3 hours

Max. Marks: 60

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

Part-A (10 × 2 = 20 Marks)

1. Why quinhydrone electrode cannot be used for solution of pH above 9?
2. A Zn rod is placed in 0.1M ZnSO₄ solution at 298K. Write the electrode reaction and calculate the potential of the electrode ($E^0_{Zn} = -0.76V$).
3. What is the difference between internal treatment and external treatment?
4. Name any three substances used for sterilization of water and mention the units expressed for hardness of water?
5. What is condensed phase rule and when it is used?
6. Write the applications of eutectics.
7. What do you mean by quantum dots and nano crystals?
8. List the different shapes of SWCNTs.
9. Give any four industrial applications of membranes.
10. Define the term refractory. How are refractories classified?

Part-B (5 × 8 = 40 Marks)

(All sub-questions carry equal marks)

11. a) Derive the Nernst equation?
b) Calculate the EMF of a cell at 25⁰C consisting of Zn and Fe electrodes immersed in solution of Zn²⁺ ions of 0.1 M and Fe²⁺ ions of 0.01M concentrations S.R.P.s of Zn and Fe are -0.76 and -0.44 V respectively.
12. a) Illustrate and explain softening of water by Deionization method.
b) Write a note on break point chlorination of water.
13. a) Explain the Cu-Ni alloy system with the help of a neat phase diagram.
b) Discuss Pb-Sn system on the basis of phase rule.
14. a) List the applications of nanomaterials.
b) Explain Sol-Gel synthesis for producing nanomaterials with a neat sketch.
15. a) Explain the requisites of a good refractory and write industrial uses.
b) Write short notes on phase inversion and solvent evaporation methods.
16. a) Construct Calomel electrode and write its electrode notation and electrode reaction.
b) Discuss the chemistry of EDTA method used for estimation of hardness of water.
17. Answer any *two* of the following:
 - a) Desilverisation of lead.
 - b) Synthesis of PPO and PES.
 - c) Write notes on porosity and thermal spalling.

