

**FACULTY OF ENGINEERING**

**B.E. II-Semester (CBCS) (Suppl.) Examination, November /December 2018**

**Subject : Engineering Chemistry-II**

**Time: 3 Hours**

**Max. Marks: 70**

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

**PART-A (10x2 =20 Marks)**

- 1 Define the terms (i) equivalent conductance and (ii) Molar conductance.
- 2 Represent glass electrode and mention its use.
- 3 Explain the concept of fuel cells
- 4 Differentiate primary and secondary batteries
- 5 What is pilling-Bed worth rule? Explain
- 6 Explain tinning method
- 7 What are the characteristics of a good fuel?
- 8 Why are gaseous fuel more advantageous than solid fuels?
- 9 What is layered composite? Provide one example of layered composite
- 10 Explain importance of "atom economy" with a suitable example.

**PART-B (5x10=50 Marks)**

11. a) At 298K, The solution of 0.1M KCl and 0.1M AgNO<sub>3</sub> gave the resistance of 337.6 and 397.9 ohms respectively. Calculate (i) the cell constant (ii) equivalent conductance of 0.1M Ag NO<sub>3</sub>, given conductivity of 0.1M KCl =  $1.286 \times 10^{-3} \text{ S-cm}^{-1}$   
b) Define the term Single electrode potential. How do you determine the electrode potential of Zn/Zn<sup>2+</sup> using potentiometer? Explain.
- 12 a) Explain H<sub>2</sub>-O<sub>2</sub> fuel cell with diagram and cell reaction  
b) What are Lithium ion batteries? Explain its advantages and applications.
- 13 a) What is meant by electrochemical corrosion? Explain its mechanism.  
b) Write a note on cathodic protection by impressed current method.
- 14 a) Calculate the volume of air required for complete combustion of 1m<sup>3</sup> of gaseous fuel having the composition : CO=46%, CH<sub>4</sub>=10%, H<sub>2</sub> = 4%, C<sub>2</sub>H<sub>2</sub>= 2.0%, N<sub>2</sub> = 1.0% and remaining being CO<sub>2</sub>. <http://www.osmaniaonline.com>  
b) Explain the terms (i) Knocking (ii) Octane number (iii) Cetane number
- 15 a) Differentiate between fibre and particle-reinforced composites.  
b) Explain the molecular ordering in liquid crystals and mention their applications.
- 16 a) Derive Nerst equation and explain its use.  
b) Write a note on photovoltaic cells.
- 17 a) What are the various factors effecting rate of corrosion? Explain.  
b) Explain ultimate analysis of coal and mention its significance.

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