CBCS SCHEME

USN | | | | | | | | | | |

18CHE12

First Semester B.E. Degree Examination, Dec.2018/Jan.2019
Engineering Chemistry

Time: 3 hrs. Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

Module-1

1 a. Define terms : (i) Free energy (ii) Entropy (iii) Cell potential. **(06 Marks)**

b. For the cell, Fe | Fe^{2+}(0.01M) || Ag^{+} (0.1M) | Ag, write the cell reaction and calculate the e.m.f of cell at 298 K, if standard potentials of Fe and Ag electrodes are – 0.44 V and +0.8V respectively. **(07 Marks)**

c. What are Secondary Batteries? Explain the construction and working of Nickel – metal hydride (Ni - MH) battery. Mention its applications. **(07 Marks)**

OR

2 a. Define Primary, Secondary and Reserve batteries with examples. **(06 Marks)**

b. What are concentration cells? The cell potential of copper concentration cell Cu | $CuSO_4$ (0.005M) || $CuSO_4$ (X) | Cu is 0.0295 V at 25°C. Calculate the value of X. **(06 Marks)**

c. Explain the construction and working of glass electrode giving its application in determination of pH of solution. **(08 Marks)**

Module-2

3 a. Define corrosion. Describe the electrochemical theory of corrosion taking rusting of iron as an example. **(07 Marks)**

b. Explain (i) Water line corrosion (ii) Pitting corrosion. **(06 Marks)**

c. What is electroless plating? Explain electroless plating of Nickel. **(07 Marks)**

OR

4 a. What is meant by metal finishing? Mention (any five) technological importance of metal finishing. **(06 Marks)**

b. Explain the process of (i) Galvanizing (ii) Anodising of Aℓ. **(07 Marks)**

c. What is electroplating? Explain electroplating of chromium. Mention why chromium cannot be used as anode. **(07 Marks)**

Module-3

5 a. Define calorific value of fuel. Explain the experimental determination of calorific value of solid / liquid fuel using Bomb calorimeter. **(08 Marks)**

b. What are fuel cells? Describe the construction and working of Solid Oxide Fuel Cell (SOFC). **(06 Marks)**

c. What are Solar cells? Explain the construction and working of photovoltaic (PV) cell. **(06 Marks)**

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