

FACULTY OF ENGINEERING

B.E. II-Semester (CBCS) (Backlog) Examination, November 2020

Subject : Engineering Chemistry-II

Time : 2 hours

Max. Marks : 70

Note: Answer any five questions from Part-A, & any Four questions from Part-B.

PART – A (5 x 2 = 10 Marks)

- 1 The resistance of 0.5m solution of an electrolyte in a cell was found to be 45Ω . Calculate the molar conductance of the solution if the electrodes in the cell are 2.2 cm apart and have an area of 3.8cm^2 .
- 2 Write the Nernst equation and explain the terms in it.
- 3 What are photo voltaic cells? Explain
- 4 Write the advantages of Lithium in batteries.
- 5 What is Pilling-Bed worth rule? Explain its significance.
- 6 What are corrosion inhibitors? Give two examples.
- 7 Define i) HCV ii) LCV of a fuel
- 8 Define cracking and knocking terms in liquid fuels.
- 9 Write the applications of composite materials.
- 10 Write any four principles of Green Chemistry.

PART – B (4 x 15 = 60 Marks)

- 11 a) The molar conductance's of sodium acetate, hydrochloric acid and sodium chloride at infinite dilution are 91.0×10^{-4} , 426.16×10^{-4} and $126.45 \times 10^{-4} \text{ S.m}^2.\text{mol}^{-1}$, respectively, at 25°c . Calculate the molar conductance at infinite dilution for acetic acid.
b) How do you determine the pH of a solution by using Glass electrode? Explain.
- 12 a) Explain $\text{H}_2\text{-O}_2$ fuel cell and write the reactions occurring at anode and cathode.
b) Differentiate primary and secondary batteries. Discuss the applications of Lead – acid battery.
- 13 a) Discuss the mechanism of electro chemical corrosion.
b) Explain impressed current cathode method of protection of corrosion.
- 14 a) A sample of coal was found to contain the following constituents: C =81%; O =8%, S =1%, H =5%, N =1%, ash =4%. Calculate the minimum amount of air required for the complete combustion of 1 kg of coal. Also calculate the percentage composition by weight of the dry products of combustion. Oxygen in air is 23% by weight.
b) Write a note on ultimate analysis of coal and explain its significance.

- 15 a) What are fiber reinforced composites? Explain the advantages of composites.
b) Describe molecular ordering in liquid crystals.
- 16 a) What are various types of potentiometric titrations? Explain the principle involved in those titrations.
b) Write a note on methanol-oxygen fuel cell.
- 17 a) Explain (i) water line corrosion (ii) galvanizing method.
b) Discuss the concept of trans esterification in bio-diesel.

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