Total No. of Printed Pages:2

**F.E. Semester- I (Revised Course 2019-20)**
**EXAMINATION AUGUST 2021**
**Chemistry**

**[Duration : Two Hours]** **[Total Marks : 60]**

**INSTRUCTIONS**

1) Answer THREE FULL QUESTIONS with ONE QUESTION FROM EACH PART.
2) Draw diagrams wherever necessary.
3) Assume additional data of required.

**PART-A**

Q.1 a) A galuanic cell to be operated at $25^0$C is set up. Write the cell reprasentation and chemical reactions involved in the cell. Also find the EMF of the cell assuming that Ni was dipped in 0.02 Hni salt solution and Ag rod was dipped in 0.05 M Ag salt solution (give $E^0$Ni = -0.23v and $E^0$Ag = 0.80v) (6)

b) With the help of heat labeled diagram and rclcvant reaction's explain 'Electrochemical Corrosion' (6)

c) Explain any one suitable method for protection against corrosion of an underground pipeline mode up of Iron metal (4)

d) Explain the construction and working of Zn- air battery. (4)

Q.2 a) The following cell Zn/ $Zn^{2+}_{(0.005M)}$ // $Zn^{2+}_{(0.05M)}$ /Zn was used in order to obtain electrical energy. Explain the working principle of the cell with the help of heat diagram and find it ENF. ( give $E^0$Zn= -0.76v) (6)

b) An article upon cleaning after a period of over a year, was found to have developed ting forces of discoloration on its surfaces. Explain the type of corrosion the article has supported with suitable. Explain and relevant reactions. (6)

c) Explain briefly 'Anodization' as a tool for corrosion protection. (4)

d) Explain the constructor and working of Li-ion polymer battery. (4)

Q.3 a) Explain the method for determination of pH of a given solution using Glass electrode. Desire the relationship between pH and EHF of the cell. (6)

b) Outline the mechanism involved in dry corrosion. (6)

c) Describe galvanic corrosion with the help of a suitable example. (4)

(4)



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d) Explain any four cell characteristics you know.

## PART-B

Q.4
a) Outline the structure property relationship in polymers. (6)
b) With the help of a heat labeled block diagram explain the working uv-v is spectrometry. (6)
c) Discuses briefly geometrical isomaism in chemical structures. (4)
d) Discuss the degradation in polymers due to oxidation and ESC. (4)

Q.5
a) Explain the bulk and suspension methods of polymerization. (6)
b) With the help of a heat labeled block diagram explain the working of FTIR. (6)
c) Discuss briefly projection a formula is in chemical structure. (4)
d) Classify polymer based on (4)
   i) Types of polymerization
   ii) Structure and number of monomer

Q.6
a) Outline the mechanism of Beckmann rearrangement and reimaf –tiemann reaction (6)
b) With the help of a heat labeled block diagram explain the working of 'Gas chromatography' (6)
c) Discuss mining of crude oil. (4)
d) Classify polymers based on (4)
   i) Source of availability
   ii) Response to heat

## PART-C

Q.7
a) Draw a heat labeled diagram of calomel electrode write its representation and reaction involved (5)
b) Explain electrodes plating with a suitable example. (5)
c) Discuss briefly the term chirality and evaluations (5)
d) What do you understand by the terms 'degree of polymerization' and ' functionality' in polymers. (5)

Q.8
a) Explain the construction and working of silver / silver chloride electrode (5)
b) Explain the process of electroplating a surface with chromium. draw relevant diagram (5)
c) Explain crestfallenly in polymers with regard to Tg and Tm (5)
d) Outline the classification of combustible fuels. (5)



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