National Institute of Technology, Tiruchirappalli

End Sem Examination- Reassessment

DEPARTMENT	**:**	**Chemistry**	
DATE & TIME OF EXAM	**:**	**22.12.2020 & 10.00 AM**	
SUB CODE	**:**	**CHIR11**	**DURATION: 120 min**
FACULTY NAME	**:**	**Dr. M. Karthik**	

Marks = 30

Instructions

1. Write **your Name, Roll No.**and **SET** at **top right corner of First page.**
2. Mention **Page numbers** at the **bottom right corner**.
3. **Scan answer sheet clearly** in **Portrait mode**.
4. **Scanned page** should be **coloured** and NOT in a gray/black mode.
5. The answers must be written in neat and **legible handwriting.**
6. **Every answer** must be **separated** from each other, either by a **horizontal line** or 3-4 lines of **gap** or preferably on **next page**.
7. **Answers** must **not** be **copied** from each other.
8. **Violation** of the abovementioned **rules** may result in **loss** of **marks.**

Note to Student:

1. **Make sure the 'Declaration and statement of authorship' is uploaded along with the answer sheet as cover sheet (First Sheet)**
2. **TIME MANAGEMENT IS YOUR RESPONSIBILITY**

Answer all the questions

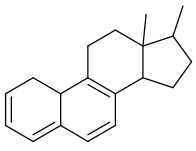
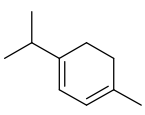
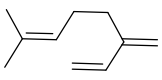
1. **a)** The reduction potentials of Cu^{2+}/ Cu and Cu^{+} / Cu at 25°C are 0,337 and 0.521 volts respectively. a) Calculate the standard e.m.f for this reaction. $Cu^{2+} + e^{-} \rightarrow Cu^{+}$.

   b) Calculate $\Delta G°$ for the above reaction. C) Is it easy to oxidise Cu to Cu^{2+} or Cu to Cu^{+} **(3 marks)** **(or)**

   (b) Construct the concentration cells with transference; reversible with cation and write its Nernst equation. **(3 marks)**

2. Explain chemical corrosion and its types with suitable mechanism. **(3 marks)**
3. Draw the phase diagram for Sulphur system and explain different areas, triple points and curves? **(3 marks)**
4. 2 g of $CaCO_3$ dissolve in HCl and the solution made up to 2 L with distilled water. 50 mL of solution required 39 ml of EDTA solution for titration. 50 ml hard water require 15 mL of EDTA solution and after boiling and filtering Require 10 ml of EDTA. Calculate the Carbonate , Non-carbonate and total hardness.. **(3 marks)**
5. 1 liter sample of water on analysis has been found to contain the following impurities. $FeSO_4$=30.4mg, $CaSO_4$=13.6mg, $MgCl_2$=48mg, $Ca(HCO_3)_2$=32.4mg $Mg(HCO_3)_2$=14.6 mg, NaCl=11.7 mg. Find the temporary & permanent hardness and total hardness of water in ppm units, givien assuming the at. Mass of Fe=56, Ca=40, Mg=24, Na=23.

   3 marks)
6. Explain in detail the internal treatment of boiler feed water. **(3 marks)**
7. Calculate the absorption maximum using woodwards – fieser rule **(3 marks)**

8. Differentiate between chromophores and auxochromes with suitable examples. **(1.5 marks)**

9. The following characteristic peaks were observed in the infrared spectrum of an organic compound having the formula C_2H_6O.

   (a) Strong band at 3300 cm^{-1} **(b)** Band at 2965 cm^{-1} **(c)** Band at 2920 cm^{-1} **(b)** Band at 1050 cm^{-1} name the compound with proper explaination.. **(1.5 marks)**

10. Explain the reason behind the following order of strength of polymers:

    Polyethylene (PE) < Polyvinylchloride (PVC) < Polystyrene (PS) **(2 marks)**

11. Write the ionic polymerisation mechanism of additional polymerization.(**2 Marks**)

12. Explain a) Thermoplastic b) Thermosetting polymers with suitable examples. (**2 Marks**)