

**U.G. 6th Semester Examination - 2020****CHEMISTRY**

Course Code : BCEMCCHC601

Course Title : Inorganic Chemistry V

Full Marks : 30

Time : 2 Hours

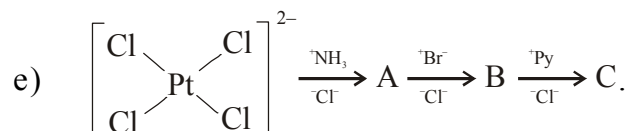
*The figures in the right-hand margin indicate marks.**Candidates are required to give their answers in their own words as far as practicable.*

1. Answer any **ten** from the following:  $1 \times 10 = 10$
- Write the name and formula of a sandwich compound.
  - Write the formula of a homogeneous catalyst used for hydrogenation of olefins.
  - Among  $\text{Mn}_2(\text{CO})_{10}$  and  $\text{Co}_2(\text{CO})_8$ , which one possess at least one bridged CO group?
  - Among  $[\text{Cl}_3\text{Pt}(\text{C}_2\text{H}_4)]^-$  and  $[\text{Cl}_3\text{Pt}(\text{C}_2\text{F}_4)]^-$ , which compound has greater C–C bond length?

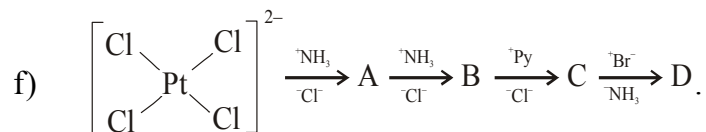
- Write down the formula of a Ruthenium compound which possesses both linear and bent Nitrosyl group.
- Name the product obtained when ethylene is oxidised by oxygen in presence of  $[\text{PdCl}_4]^{2-}$  as catalyst.
- Write down the name of a Titanium based heterogeneous catalyst used for polymerization of ethylene.
- What is 'trans effect'? Give answer with proper example.
- What do you mean by 'Prosthetic group'?
- What is 'Co-factor'? Give a suitable example.
- Write down the effect of deficiency of potassium in human body.
- For Hemocyanin (HC), write down the colour of the protein after oxygenation.
- Write the biochemical role of magnesium.
- Alzheimers' disease is caused by excessive intake of a metal, mention the metal's name.
- Name one of chelation drug and its' one important use.

2. Answer any **five** from the following:  $2 \times 5 = 10$

- a) For the compound  $[\text{Rh}_2(\text{Co})_4(\mu\text{-Cl})_2]$ , calculate the electron count for each Rh atom.
- b) For the compound  $[\text{Cr}_2(\text{Cp})_2(\text{NO})_2(\mu\text{-NO})_2]$ , the observed IR stretching frequencies for the NO group are  $1672\text{ cm}^{-1}$  and  $1505\text{ cm}^{-1}$ . State with reason which frequencies correspond to which NO group.
- c) Among  $[\text{Cp}_2\text{Fe}]$  and  $[\text{Cp}_2\text{Mn}]$  which one is paramagnetic? Calculate the spin only magnetic moment in B.M. for that paramagnetic compound.
- d) What is the role of  $\text{CuCl}_2$  in 'Wacker' process?



Predict A, B and C with proper structure.



Predict A, B, C and D with proper structure.

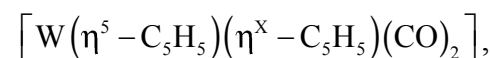
- g) How Myoglobin and Hemoglobin carry oxygen in our human body? Explain with structure.

- h) Write a short note on Hemerythrin (Hr) with structure.

3. Answer any **two** of the following:  $5 \times 2 = 10$

- a) i) Describe the structural aspects of the anionic part of zeise salt in the light of Dewar-Chat-Duncanson model.

- ii) In the compound



for what value of 'X' (hapticity) the compound will follow the 18 electron rule?  $3+2=5$

- b) i) Write the formula of the Wilkinson's Catalyst.

- ii) With the help of a Tolman Catalytic Loop, describe the hydroformylation reaction of an Olefin.  $1+4=5$

- c) i) Explain the functioning and importance of  $\text{Na}^+/\text{K}^+$  pump or Ion pump.

- ii) Cisplatin has a wide use as anti cancer drug but it has some serious toxicity, briefly mention it.  $4+1=5$