RAMAKRISHNA MISSION VIDYAMANDIRA

(Residential Autonomous College affiliated to University of Calcutta)

SECOND YEAR [BATCH 2014-17]

B.A./B.Sc. FOURTH SEMESTER (January – June) 2016

Mid-Semester Examination, March 2016

Date : 18/03/2016 **CHEMISTRY (General)**

Time : 12 noon – 1 pm Paper : IV Full Marks : 25

[Use a separate Answer Book for each group]

Group – A

Answer <u>any one</u> question :

1. a) Why is air passed during the extraction process of silver from its sulphide ore silver glance? Explain. [1·5]
   b) Write down the all reactions involved in the extraction of gold by cyanide process. [1·5]
   c) Write notes on cupellation. [2]
2. a) How does chromium occur in nature (with composition)? [1]
   b) Write the procedure and reactions for the extraction of pure chromium from its principal ore. [4]

Answer <u>any one</u> question :

3. a) Explain the primary standard and secondary standard solution with examples. [2]
   b) 2·3 gm of an Iron sample is dissolved in acid and the volume is made upto 250ml. 25ml of the solution is titrated with $0{\cdot}1042\left(\frac{N}{10}\right)$ $KMnO_4$ and the volume required is 23 ml till end point. Calculate the purity of iron in the sample. [3]
4. a) How will you prepare 250ml $\left(\frac{N}{20}\right)$ oxalic acid? (mol. wt of oxalic acid : 126) [1]
   b) Calculate the amount of oxalic acid required to neutralise 25cc $\left(\frac{N}{10}\right)$ K MnO_4. [2]
   c) Discuss the principle of estimation of Ca^{+2} and Mg^{+2} in a mixture with EDTA. [2]

Group – B

Answer <u>any one</u> question :

5. a) Write the Haworth projection formula of α – D – glucopyranose. [1]
   b) Predict the products (A) to (E) of the following reactions. [4]

   i) α – D – glucopyranose $\xrightarrow[H^+/\Delta]{MeOH}$ (A).

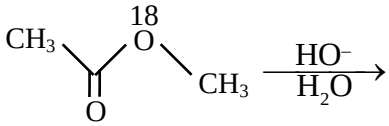
   i) D – glucose $\xrightarrow[\text{excess}]{Ph\,NHNH_2}$ (B) $\xrightarrow[H_2O]{HCl}$ (C)

   ii) D – Arabinose $\xrightarrow{HCN}$ (D) + (E)
6. a) How can you convert D – glucose to D – Arabinose? [3]
   b) How can you establish that glucose contains 5 hydroxyl groups? [1]
   c) Predict the product of the following reactions

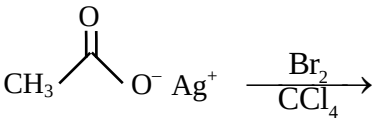
   D – glucose $\xrightarrow[H_2O]{Br_2}$ [1]

Answer <u>any one</u> question :

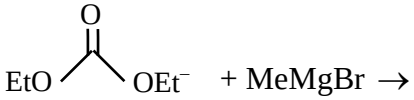
7. a) Predict the product of the following reactions. Give mechanism. [2]



b) Predict the product of the following reactions. [3]

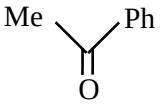
i) 

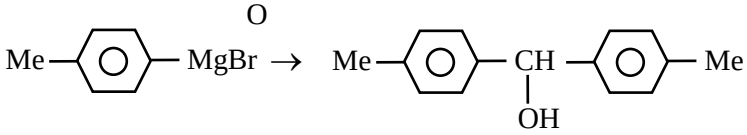
ii) $PhMgBr + CH(OC_2H_5)_3 \rightarrow$

iii) 

8. a) Carry out the following conversions. [5]

i) $PhMgBr \rightarrow$ 

ii) $PhMgBr \rightarrow$ 

iii) 

<u>Group – C</u>

Answer <u>any one</u> question :

9. a) Write down any one of the statements of the second law of thermodynamics. [2]
   b) i) Write down 'Clausius inequality' [1]
   ii) From there show that the entropy of universe increases with time. [2]

10. a) What is the condition for spontaneity of a process at constant T & P? [2]
    b) Calculate the molar entropy change for vaporisation of water at 0°C, 1 atm. [3]

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