

- b) Describe Winkler's method to determine the dissolved oxygen in water sample.
- c) What do you understand by accuracy and precision of measurement? What is standard deviation?
- d) How do you explain the blue colour of slight excess I_2 in the presence of starch?
- e) What is ion-exchange chromatography? What are the fundamental requirements of a useful resin?
- f) How the velocities of mobile phase (u) and analyte \bar{v} are related to capacity factor (k')? $1+2+1\frac{1}{2}+1\frac{1}{2}+1+1$
3. a) Calculate the amount of Fe^{2+} left at the end-point of a titration of 0.1(N) solution of Fe^{2+} with 25 mL of 0.1 (N) $KMnO_4$ in 2(N) H_2SO_4 medium.
- [$E^\circ_{Fe^{3+}/Fe^{2+}} = 0.76 V$; $E^\circ_{MnO_4^-/Mn^{2+}} = 1.52 V$]
- b) "The EMF is more positive for the Fe^{3+}/Fe^{2+} couple in presence of O-phenathroline and more negative in presence of F^- as compared to EMF of the couple in absence of these species." Explain.
- c) What is ionization suppressor? How does it function?
- d) Giving chemical reactions, suggest a volumetric method for estimation of vanadium. $3+2+2+2$

FINAL B. SC. EXAMINATION, 2017

(1st Semester)

CHEMISTRY (HONOURS)**PAPER - XIV****ANALYTICAL CHEMISTRY**

Time : Two hours

Full Marks : 25

Attempt *all* questions.

1. a) What do you mean by 'Polarographic Maxima'? Name a maximum suppressor.
- b) What is $E_{\frac{1}{2}}$? State its features.
- c) Describe the underlying principles of coulometric analysis. Distinguish between Primary coulometric analysis and secondary coulometric analysis.
- d) Mention the potential window of DME. Show that for diffusion controlled polarographic experiment, i_d will be directly proportional to the square root of 'h'; where 'h' is the height of the DME. $1\frac{1}{2}+1\frac{1}{2}+2+3$
2. a) The titration of $KMnO_4$ by oxalic acid in HCl medium is not interfered by Cl^- oxidation however, the titration of Fe^{2+} by MnO_4^- in HCl is affected by Cl_2 liberation. How would you explain this observation?

[Turn over