

FINAL B.Sc. EXAMINATION, 2018

(1st Semester)

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

Time : Two hours

Full Marks : 25

Answer *all* questions

- b) In chromatography, define the following terms :
 (i) Resolution (R_s) and (ii) Capacity factor (K'). 3
- c) Why the iodometric titration should not be carried out in strongly acidic or alkaline media ? 2
- d) What is iodized salt ? How would you determine the available iodine in iodized NaCl salt ? 2
3. a) "Estimation of Fe^{3+} after reduction with $SnCl_2$ solution, Zimmermann-Reinhardt solution is necessary for permanganometry but not for dichromatometry." Explain. 2
- b) Explain the underlying principle of flame photometry based on Scheibe-Lomakin equation. Write down two real life applications of flame photometry. 2
- c) A 7.25×10^{-5} M solution of $KMnO_4$ has a transmittance of 44.1% when measured in a 2.10 cm cell at a wavelength of 525 nm. Calculate the molar absorptivity of $KMnO_4$. 2

1. a) Define $E_{1/2}$. Mention the physical significance of $E_{1/2}$. Under which condition(s), the $E_{1/2}$ value of a particular redox couple may undergo changes ? 1+1+1
- b) Mention the merits of DME as used in polarography. What will be the consequence, if the applied potential on DME exceeds +0.44 V versus SCE ? 2+1
- c) For a particular DME, the capillary constant, $m^{2/3} \times t^{1/6}$, is 1.79 with 'm' in $mg\ s^{-1}$ and 't' in second. Employing 0.5 mM of an electroactive species, i_d was found to be $7.3\ \mu A$. Given the diffusion coefficient of the species to be $7.3 \times 10^{-6}\ cm^2\ s^{-1}$. Calculate the number of electrons involved in this process. 2
- d) Describe the underlying principle of coulometric analysis. 2
2. a) What is ion-exchange capacity ? How do you determine the ion exchange capacity of a cation exchange resin in the laboratory ? 2

[Turn over