Total No. of Questions – [3] Total No. of Printed Pages: 2

G.R. No.	

Paper Code – UI18-1011(T1)

OCTOBER 2018 / IN-SEM (T1)

F. Y. B.TECH. (Common) (SEMESTER - I)

COURSE NAME: Engineering Chemistry

COURSE CODE: ES10184B

(PATTERN 2018)

Time: [1 Hour] [Max. Marks: 20]

(*) Instructions to candidates:

1) **All questions are compulsory.**
2) **Figures to the right indicate full marks.**
3) **Use of scientific calculator is allowed.**
4) **Use suitable data where ever required.**

Q.1) Attempt any **two**

(a) (i) What are types of hardness? **(4Marks)**
(ii) 25 ml water sample required 17.5ml of 0.02M EDTA for end point where as 25 ml boiled water sample required 9.1 ml of 0.02M EDTA for end point. Calculate total, temporary and permanent hardness

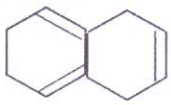
(b) Give exchange reactions and regeneration reactions of following salts by using ion exchange reaction process (i)$CaCl_2$ (ii) $MgSO_4$ **(4Marks)**

(c) Define sewage. Explain preliminary and any one secondary sewage water treatment process **(4Marks)**

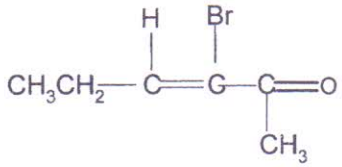
Q.2) Attempt any **two**

(a) Calculate λ_{max} for the following compounds (Explain calculations): **(4Marks)**

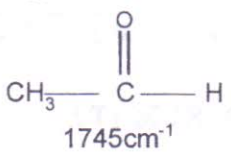
(i)



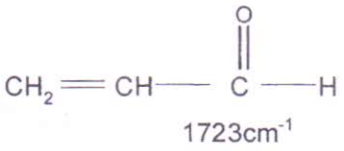
(ii)



(b) (i) Justify the C=O stretching absorption in the following compounds in IR spectroscopy **(4Marks)**



1745cm^{-1}



1723cm^{-1}

(ii) How can you distinguish between aldehyde and ketone using IR spectroscopy?

(c) Predict the number of signals and multiplicity of respective signals in the following compounds in NMR spectroscopy (explain and draw signals for showing multiplicity) **(4Marks)**

(i) $Br—CH_2—CH—Br_2$

(ii) $CH_3—CH_2—Cl$

Q.3) Attempt any **one**

(a) Volumetric analysis of producer gas used as a fuel is as, H_2 = 20%, CO = 18%, N_2 =50%, CH_4 = 2%, CO_2 = 10%. If 25% excess air is used, find the volume of air actually supplied per m^3 of the gas. **(4Marks)**

(b) Define power alcohol. Give 3 advantages and 3 disadvantages of power alcohol. **(4Marks)**