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

G.R. No.	

Paper Code- U128-104 (T1)

MARCH 2019 / INSEM (T1)

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

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) Compare Zeolite and ion exchange method for water softening (Give 4 points of comparison) **[4]**

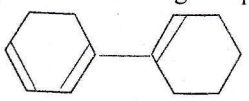
b) (i) Explain temporary hardness of water **[4]**
(ii)Calculate total hardness of water containing the following per liter: $CaSO_4$ = 16.2 mg, $Mg(HCO_3)_2$ =1.4mg, $MgCl_2$= 9.5mg

c) Explain removal of microorganism by chlorination in domestic water treatment with reaction, factors affecting efficiency , 2 advantages and 2 dis advantages **[4]**

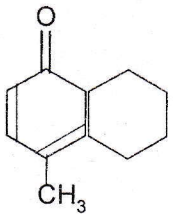
Q.2) Attempt any **two**.

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

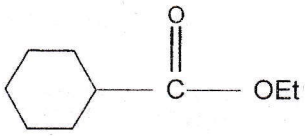
(i)



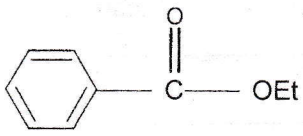
(ii)



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



1740cm^{-1}



1715cm^{-1}

(ii) Explain overtone band and combination band in IR spectroscopy

c) Predict the number of signals and multiplicity of respective signals in the following compounds in NMR spectra (Draw the signals in low resolution and high resolution) **[4]**

(i) $CH_3—CH—Cl_2$

(ii) $CH_3—CH_2—CH_2—CH_2—CH_3$

Q.3) Attempt any **one**

a) A liquid fuel sample contains 80% C and 20% H. calculate the quantity of air with 10% excess required for complete combustion of 2 kg of fuel. **[4]**

b) Define biodiesel. Give preparation reaction of biodiesel. Give 2 advantages of biodiesel. **[4]**