Roll No. | | | | | | | | | | | |

Total No. of Pages: 02
Total No. of Questions: 09

B.Tech (Sem.-1st & 2nd)

ENGINEERING CHEMISTRY

Subject Code: CH-101
Paper ID: [A0110]

Time: 3 Hrs. **Max. Marks: 60**

INSTRUCTIONS TO CANDIDATE:

(i) Question no. 1 is compulsary.
(ii)Attempt five question from part A and part B with at least two questions each from part A and part B

Q.1.Short Answer Questions:-

(a) Why does the $Mg(HCO_3)_2$ require double amount of lime for softening.

(b) Describe reason for cracking

(c) With reference to chromatography explain (a) retention time (b) retention factor

(d) What is the difference electrode potential and cell e.m.f

(e) Differentiate between singlet and triplet state

(f) Define isotactic polymers

(g) Explain Beer-Lambert Law

(h) Explain the selection rule of UV-vis Spectroscopy

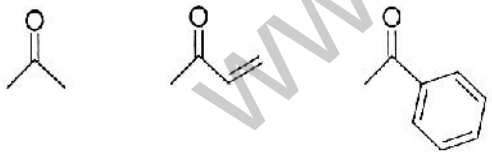
(i) Determine the number of components, number of phase and degree pf freedom on the following equilibria

(i) $N_2O_4(g) \rightleftharpoons 2NO_2(g)$

(ii) $NH_4CL(s) \rightleftharpoons NH_3(g)+HCL(g)$

When $P(NH_3)=P(HCL)$

(J) Which of the following will absorb at higher wave number for c=o stretching



PART –A

Q.2. (a) Describe the methods of the treatment of municipal water.

(b) Calculate the amount of lime and soda required for softening 90,000 liters of water containing the following salts per liter: $Ca(HCO_3)_2$ = 162mg, $CaSO_4$ = 136mg and NaCI=56.1mg. purity of lime is 92% and soda is 99%

Q.3. Explain the electrochemical mechanism of rusting of iron in humid atmosphere. Discuss any four that affect the rate of corrosion.

Q.4. Compare the working of HPLC with column chromatography

Q.5. Explain the construction and working of (a) dry cell (b) lead storage battery (c) hydrogen-Oxygen fuel cell

PART –B

Q.6. Draw a well labelled jablonski diagram and explain (a) Intersystem crossing (b) Phosphorescence

Q.7. (a) Explain principles of NMR Spectroscopy

(b) Butadiene shows absorption at higher wavelength than ethene . why?

Q.8. Discuss the NMR Spectra of the following compounds

(a) CH_3COOCH_3 (b) $CH_3CH_2CH_3$ (c) CH_3OCH_3 (d) $CH_3COOCH(CH_3)_2$

Q.9. State and explain phase rule, Describe phase diagram of potassium, iodine-water system nicotine-water system

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