

Roll No.

Total No. of Questions : 09]

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

ENGINEERING CHEMISTRY

SUBJECT CODE : CH - 101 (2k4 & Onwards)

Paper ID : [A0112]

[Note : Please fill subject code and paper ID on OMR]

Time : 03 Hours

Maximum Marks : 60

Instruction to Candidates:

- 1) Section - A is **Compulsory**.
- 2) Attempt any **Five** questions from Section - B & C.
- 3) Select atleast **Two** questions from Section - B & C.

Section - A

Q1)

(Marks : 2 each)

- a) What is break point chlorination?
- b) Bolt and nut made of same material is preferred in practice. Why?
- c) What is R_f value in chromatography?
- d) An aqueous solution of copper sulphate is acidic in nature. Why?
- e) What are the dark reactions?
- f) Corrosion is reverse to extraction. Explain.
- g) Define and explain degree of freedom.
- h) Why is TMS used as an internal standard for NMR?
- i) Why water softened by zeolites is unfit for use in boilers?
- j) Mention two limitations of phase rule.

Section - B

(Marks : 8 each)

Q2) What are ion exchange resins? Discuss their application in water softening. How are spent resins regenerated?

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- Q3)** (a) Explain the process of galvanization of iron. How does it prevent the corrosion of iron?
(b) Outline the difference in hydrogen embrittlement and pitting corrosion with suitable examples.

- Q4)** Write detailed notes on :
(a) Partition chromatography.
(b) Paper chromatography.
(c) Thin layer chromatography.

- Q5)** (a) What are secondary cells? Describe the construction of one secondary cell.
(b) A cell consists of two hydrogen electrodes. The negative electrode is in contact with a solution of 10^{-6} M hydrogen ions. The EMF of the cell is 0.118 V at 25°C . Calculate the concentration of hydrogen ion at positive electrode.

Section - C

(Marks : 8 each)

- Q6)** (a) Describe and discuss Jablonski diagram for depicting various photo processes.
(b) What are the conditions required for laser action to take place? Describe optical pumping of lasers.
- Q7)** (a) Explain processes that contribute to the finite width of a spectral line.
(b) What are different kinds of electronic transitions? Explain chromophores and auxophores.
- Q8)** (a) Give the high resolution ^1H NMR of methyl ethyl ether.
(b) Write short notes on chemical shift and magnetic resonance imaging.
- Q9)** (a) What is condensed phase rule? When is it applied?
(b) Draw a neat labelled phase diagram of water system and explain areas, curves and triple points on it.