25

SHAHEED BHAGAT SINGH STATE TECHNICAL CAMPUS, FEROZEPUR

ROLL NO : | | | | | | | | | | | |

Total number of pages: [2]

Total number of questions: [6]

B.Tech. - 1st Sem

Engineering Chemistry

Subject Code :BTCH-101 A

Paper ID :

Time allowed: 3 Hrs

Max Marks:60

Important Instructions:

- **Section A is compulsory**
- **Assume any missing data / additional instructions, if any**

PART A (2×10)

Q. 1. Answer in brief:

(a) What is Chromophore and Auxochrome ?
(b) Draw diagram for a NMR Spectrometer.
(c) Discuss Degree French (°Fr) and Degree Clarke (°Cl).
(d) How would you describe Metathesis in green chemistry ?
(e) What is Passivity ?
(f) Differentiate between Thermoplastic and Thermosetting polymers ?
(g) Define Self-Assembling materials.
(h) How would you describe First Generation Petrochemicals ?
(i) What is Degree of Polymerization (DP) ?
(j) What is Priming and Foaming ?

PART B (8×5)

Q.2. a) Discuss mechanism of Electrochemical corrosion. (4)
b) Explain Zeolite Process for water softening. (4)

OR

a) What are anodic and cathodic coatings used to combat corrosion ? (3)
b) Calculate the temporary and permanent hardness and amount of lime (90% pure) and soda (95% pure) required for treatment of 100000 liters of water with following analysis : $Ca(HCO_3)_2$ = 40.5 ppm; $Mg(HCO_3)_2$ = 36.5 ppm; $MgSO_4$ = 30 ppm; $CaSO_4$ = 34 ppm and NaCl = 20 ppm. (5)

Contd. to page 2.....

Q. 3. a) Discuss Frank-Condon principle. (4)
b) Explain applications of Infra-red Spectroscopy. (4)

OR

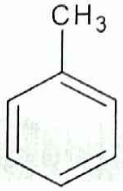
a) Discuss the principle of IR Spectroscopy. (4)
b) Explain the applications of UV-VIS Spectroscopy. (4)

Q. 4. a) Discuss ^{1}H NMR spectrum of Ethanol in detail. (4)
b) Explain with examples, Shielding and De-shielding in NMR spectroscopy. (4)

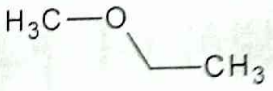
OR

a) What is mean by Coupling constant J ? (2)
b) Give number of signals and splitting pattern in following molecules :

i)



ii)



iii)

(6)

Q.5. a) Discuss Nano Scale Materials. (4)
b) How would you summarize use of Innocuous reagents in green synthesis ? (4)

OR

a) What is mean by Atom Economy in Green chemistry ? Explain in detail. (5)
b) Discuss methods of preparation of Nanomaterials. (3)

Q.6. a) Calculate the Poly Dispersity Index (PDI) of a polymer sample having 50% sample with MW 10000 and rest with MW 20000. (4)
b)) Explain the production of Propylene. (4)

OR

a) Discuss physical or chemical properties and usefulness of Natural Gas. (3)
b) How would you explain advantages and applications of Composites ? (5)

****