

B. Tech. Sem - III (Chemical Engg.) 2014 COURSE) (CBCS) :

SUMMER - 2019

SUBJECT: PHYSICAL CHEMISTRY

Day: Monday
Date: 13/05/2019

S-2019-2547

Time: 02.30 PM TO 05.30 PM
Max. Marks: 60

N.B:

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Use of non-programmable **CALCULATOR** is allowed.
- 4) Draw neat and labeled diagrams **WHEREVER** necessary.

Q.1 a) Give reason: (05)
i) Acetic acid is weaker than monochloroacetic acid.
ii) Phenols are acidic while alcohols are neutral.

b) Write a note on- Electrophile and Nucleophile. (05)

OR

Q.1 What is mesomeric effect? Give necessary conditions for delocalization. (10)
Draw the resonating structure of the following
i) Aniline ii) Nitrobenzene

Q.2 a) What is sulphonation? Discuss the mechanism of sulphonation of benzene. (05)

b) Which of the following alkyl halides will react faster by SN^2 mechanism? (05)
Justify your answer i) $CH_3-CH_2-CH_2-Br$ ii) $(CH_3)_2CH-Br$

OR

Q.2 a) Give the reagents used in synthesis of the following chemicals starting from benzene. (05)
i) Toluene ii) Nitrobenzene

b) Give the mechanism of Friedel Craft's alkylation. (05)

Q.3 a) What is the principle of IR spectroscopy? Give its applications. (05)

b) UV spectra are broad as compared to IR spectra-Explain. (05)

OR

Q.3 Explain the principle, construction and working of double beam IR spectrophotometer? Give its applications. (10)

Q.4 a) Explain adsorption theory of catalysis. How it is helpful in explaining the characteristics of catalytic reactions? (05)

b) Write a note on Enzyme catalysis. (05)

OR

Q.4 Explain the following with examples: (10)

- i) Promoters and inhibitors
- ii) Catalyst poisons
- iii) Heterogeneous catalysis
- iv) Catalyst promoters

Q.5 a) What is difference between Vander Waal's forces and intermolecular forces? (05)

b) What are H-bonds? Is it weaker or stronger than the Vander Waal's forces? (05)

OR

Q.5 How does H-bonding affect melting point and boiling point, viscosity, vapour pressure and refractive index of a compound? (10)

Q.6 a) What are surfactants? Discuss the classification of surfactants. (05)

b) Derive Gibb's adsorption isotherm equation. (05)

OR

Q.6 Write a note on: (10)

- i) Microemulsion
- ii) Cohesion

* * * * *