

**B.TECH SEM - III (2007 COURSE) (CHEMICAL ENGG.) : WINTER  
- 2017**

**SUBJECT: APPLIED CHEMISTRY-I**

Day: **Friday**  
Date: **12/01/2018**

**W-2017-2352**

Time: **10.00 A.M. TO 1.00 P.M**  
Max Marks: 80

**N.B:**

- 1) **Q.No 1 and Q. No. 5 are COMPULSORY.** Out of remaining questions Attempt **ANY TWO** questions from each section.
- 2) Answer to both the sections should be written in the **SEPARATE** answer book.
- 3) Draw neat and labeled diagram **WHEREVER** necessary.
- 4) Figures to the right indicate **FULL** marks.
- 5) Assume suitable data if necessary.

**SECTION-I**

- Q.1**
- a) What are the different types of organic reactions? Explain them with suitable examples. (06)
  - b) Discuss the mechanism of sulphonation of benzene. (04)
  - c) Give the applications of IR spectroscopy. (04)
- Q.2**
- a) What is resonance effect? Explain +R and -R effect with suitable examples. (06)
  - b) Write note on steric effect. (04)
  - c) Phenols are acidic while alcohols are neutral Explain. (03)
- Q.3**
- a) Explain 'Markonikoff's rule & peroxide effect taking example of addition of HBr to 1-butene. (06)
  - b) Write a note on Friedal craft acylation. (04)
  - c) Write a note on Dimerization. (03)
- Q.4**
- a) Define intra- red spectroscopy. Describe the various molecular vibrations of the technique. (06)
  - b) Trans- stilbene absorbs at higher wavelength than its cis- isomer. Explain. (04)
  - c) Phenol shows Red- shift an addition of alkali.Explain. (03)

**SECTION-II**

- Q.5**
- a) Describe the principle involved and working of (06)
    - i) Flame photometer
    - ii) Conductivity meter
  - b) Give the Berkeley's method for the determination of osmotic pressure of a solution. (04)
  - c) Explain principle and working of potentiometer. (03)
- Q.6**
- a) Give the van der walls equation for describing the P-V-T relationship in real gases. (06)
  - b) Calculate the osmotic pressure of a 2% solution of urea at 22<sup>0</sup>c. (04)
  - c) Write a note on karl fischer titrator. (03)
- Q.7**
- a) How the depression of freezing point of a solvent may be used to determine the molecular weight of the dissolved substance? (06)
  - b) The vapour pressure of a 2.1% solution of a non- electrolyte in water at 100<sup>0</sup>c is 755 mm.Calculate the molecular weight of the solute. (04)
  - c) Explain the principle of equipartition of energy. (03)
- Q.8**
- a) Discuss the origin of ultraviolet spectra and explain the working of UV- spectrophotometer. (06)
  - b) Give the applications of polarimeter. (04)
  - c) Give the expression for average velocity. (03)

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