

F.Y.B.SC. SEM – II (2014 COURSE) : WINTER- 2017
SUBJECT : CHEMISTRY : PHYSICAL & INORGANIC CHEMISTRY (C – 21)

Day : Monday
Date : 23/10/2017

Time : 03.00 PM TO 05.00 PM
Max. Marks : 40

W-2017-0598

N.B.:

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Use of logarithmic table / scientific **CALCULATOR** is allowed.
- 4) Answers to both the sections should be written in **SAME** answer book.

SECTION – I
[Physical Chemistry]

- Q.1** Attempt **ANY TWO** of the following: **[10]**
- a) Distinguish between thermal and photochemical reactions.
 - b) Explain the term viscosity of the liquid.
 - c) Write down van der Waal's equation and give significance of the terms involved in it.
- Q.2** Attempt **ANY TWO** of the following: **[10]**
- a) What are liquid crystals?
 - b) Discuss the phenomenon of phosphorescence.
 - c) Obtain the value of 'R' in terms of critical constants.
- Q.3** A) Solve **ANY ONE** of the following: **[05]**
- a) A solution of KMnO_4 shows 0.8 absorbance at wavelength 540 nm. Express the measurement in terms of transmittance unit.
 - b) Calculate the critical constants of a gas from the following data:
 $a = 5.33 \times 1.013 \times 10^5 \text{ Nm}^2 \text{ l}^2 \text{ mol}^{-2}$; $b = 0.04596 \text{ l}^{-1} \text{ mol}^{-1}$.
 $R = 0.08205 \times 1.013 \times 10^5 \text{ dm}^3 \text{ Nm}^{-2} \text{ K}^{-1} \text{ mol}^{-1}$.

SECTION – II
[Inorganic Chemistry]

- Q.3** B) Attempt **ANY ONE** of the following: **[05]**
- a) Explain p-p type overlap of atomic orbitals with a suitable example.
 - b) Define Hybridization of atomic orbitals. Discuss the need of concept of hybridization of atomic orbitals with reference to bonding in BeH_2 .
- Q.4** Attempt **ANY FIVE** of the following: **[10]**
- a) Define covalent bond. Give one example.
 - b) What is the difference between sigma and pi bonds?
 - c) Draw the structures of $[\text{MnCl}_4]^{2-}$ and IF_7 .
 - d) Discuss in brief, the bonding in ClF_3 on the basis of VSEPR theory.
 - e) Mention the types of overlaps of atomic orbitals in F_2 , HF , H_2 and N_2 .
 - f) Mention the assumptions of Valence Bond Theory.
 - g) Draw the structures of BrF_5 and XeO_3 .

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