

F.Y.B.Sc. SEM – II (CBCS 2018 COURSE) : SUMMER - 2019
SUBJECT : CHEMISTRY : PHYSICAL & INORGANIC CHEMISTRY – II

Day : Wednesday
Date : 10/04/2019

Time 11.00 A.M TO 02.00 PM
Max. Marks : 60

S-2019-0782

N.B.

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

SECTION – I
(PHYSICAL CHEMISTRY)

- Q.1** Attempt any **TWO** of the following: (12)
- a) Distinguish between ideal and non-ideal gases.
 - b) Describe the term 'quantum yield.
 - c) Explain the concept of vapour pressure.
- Q.2** Attempt any **TWO** of the following: (12)
- a) Elaborate on viscosity.
 - b) On the basis of kinetic molecular model explain the liquid state.
 - c) Define the terms: critical temperature, critical pressure and critical volume.
- Q.3** Attempt any **THREE** of the following: (12)
- a) Obtain the value of 'R' in terms of critical constants.
 - b) Acetone has the Van der Waals constant as $a = 1.406 \text{ Nm}^4 \text{ mol}^{-2}$, $b = 9.94 \times 10^{-5} \text{ m}^3$ and $R = 8.31 \text{ J K}^{-1} \text{ mol}^{-1}$. Find the critical volume, critical temperature and critical pressure of acetone.
 - c) Calculate ν and $\bar{\nu}$ for the radiation of wavelength,
 $\lambda = 2000 \text{ \AA}$. ($C = 3 \times 10^8 \text{ m/sec}$)
 - d) A solution of KMnO_4 shows 0.8 absorbance at 540 nm wavelength. Express the measurement in terms of transmittance units.

SECTION – II
(INORGANIC CHEMISTRY)

- Q.4** Attempt any **TWO** of the following: (12)
- a) Define hybridization of atomic orbitals. Discuss the bonding in BeH_2 .
 - b) Explain the bonding in F_2 and HF on the basis of VBT.
 - c) Explain ionic and covalent bond using suitable examples.
- Q.5** Attempt any **FOUR** of the following: (12)
- a) What is meant by sp^3 hybridization? Explain it with a suitable example.
 - b) Draw the structures of the following molecule on the basis of VSEPR theory and mention the type of hybridization – XeO_3 , TeCl_4 , BrF_5 .
 - c) What are the postulates of VBT?
 - d) Define and compare sigma and pi bonds. Give one example of each.
 - e) What are limitations of VSEPR theory?
 - f) What is atomic orbitals overlap? Explain s-s type overlap with a suitable example.

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