

## B.A/B.Sc - 2nd Semester (old sylb 2018-19)

(2721)

## Paper: Chemistry (Physical Chemistry-B)

Time Allowed: 2 hrs.

Max. Marks: 35

Note: There are EIGHT questions of equal marks. Candidates are required to attempt any FOUR questions.

1. (a) Establish a relationship between critical constants and vander Waals constants.
- (b) Draw and explain P-V isotherms of carbon dioxide.  $(5, 3\frac{3}{4})$
2. (a) Give an account of Maxwell distribution of molecular velocities. Explain the effect of temperature on molecular velocities.
- (b) Enlist various factors responsible for deviation from ideal gas behaviour.  $(6\frac{1}{4}, 2\frac{1}{2})$
3. Give an account of liquid crystals with special reference to their classification and crystalline alignment.  $(8\frac{3}{4})$
4. (a) Tabulate the structural differences between solids, liquids and gases.
- (b) Write notes on:
  - (i) Thermography
  - (ii) Seven segment cell  $(3\frac{3}{4}, 5)$
5. Explain the following:
  - (a) Tyndall effect
  - (b) Gold number
  - (c) Brownian motion
  - (d) Protective action  $(2\frac{1}{2}, 2\frac{1}{2}, 1\frac{1}{4}, 2\frac{1}{2})$
6. Elaborate the difference between the following:
  - (a) Lyophobic and lyophilic colloids

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(2)

(b) Electrophoresis and electro-osmosis

(c) sol and gel

(d) Water-in-oil and oil-in-water emulsions.

 $(2\frac{1}{2}, 2\frac{1}{2}, 2, 1\frac{3}{4})$ 

7. Explain the difference between the following giving examples:

a) ideal and non-ideal solutions

b) Molarity and molality

c) Raoult and Henry laws

d) Normal and abnormal molar masses.

 $(2\frac{1}{2}, 2\frac{1}{2}, 2, 1\frac{3}{4})$ 

8. a) Derive a relation between molecular mass and depression in freezing point of a non-volatile solute.

b) A sugar syrup of mass 214.2g contains 34.2g of sugar. Calculate molality and mole fraction of sugar.

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 $(5, 3\frac{3}{4})$ 

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