

PE-498-CV-19
M.Sc. CHEMISTRY (4th Semester)
Examination, June 2022
LIQUID STATE

Time : Three Hours]

[Maximum Marks : 80
[Minimum Pass Marks : 29

Note : Answer from both the Sections as directed. The figures in the right-hand margin indicate marks.

Section-A

1. Answer the following short answer questions: 1x10=10
- (a) Give example of liquid as dense gases and liquid as disordered solids.
 - (b) What do you mean by critical constants.
 - (c) What do you understand by single cell model.
 - (d) Define entropy.
 - (e) What is clusters expansion.
 - (f) What is radial distribution.
 - (g) What is LS vector coupling
 - (h) What is electron density and phase problem.
 - (i) Give two example of super cooled liquid.
 - (j) What are transport properties.

Section-B

2. Write a note on: 4x3=12
- (a) Correspondence principle. (b) Configuration integral.
 - (c) Configuration properties.
- OR
- Define thermodynamic relations and internal pressure with their significance in liquids. 12
3. Explain the theory of liquid partition function in detail. 12
- OR
- Write a note on: 6x2=12
- (a) LTD model (b) Significant structure model
4. Explain in detail the relationship between pair distribution function and pair potential function. 12
- OR
- Derive the following: 4x3=12
- (a) IBG Equation (b) HNC Equation (c) PY Equation
5. Explain the different spectroscopic techniques used for liquid dynamic structure studies. 12
- OR
- Explain Monte carlo and molecular dynamics methods used for computation. 12
6. Explain the following:
- (a) Theories of transport properties (b) Non Arrhenious behavior of transport properties 6x2=12
- OR
- Write a note on:
- (a) Cohen-Turnbull free volume model (b) Macedo-Litouitz hybrid model 6x2=12