

West Bengal State University
B.A./B.Sc./B.Com. (Honours, Major, General) Examinations, 2011
PART-I

CHEMISTRY — Honours
Paper-I

Duration : 4 Hours

Full Marks : 100

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

GROUP - A

Answer any *three* questions taking one from each Unit.

UNIT - I

1. a) i) What do you mean by the principle of equipartition of energy ? 2
- ii) For an ideal gas consisting of a nonlinear tri-atomic molecule, how would you calculate $\overline{C_V}$ with the help of this principle ? 3
- iii) Carbon monoxide gas gives $\overline{C_V}$ -value of $\frac{3}{2}R$ at low temperature, then it becomes $\frac{5}{2}R$ and approaches the value $\frac{7}{2}R$ at ~ 3100 K. Explain. 2
- iv) Why for linear molecules the degree of freedom corresponding to the rotation around the molecular axis, does not contribute to the total energy ? 2
- b) Write down the van der Waal's equation in the virial form. Hence deduce the expression for the Boyle temperature from the second virial coefficient. 2 + 2
- c) How does mean free path depend on temperature and pressure ? 3

