

Total Pages—4

$h = ?$

(Set-P)

B.Tech-2nd
Chemistry

Full Marks : 70

Time : 3 hours

**Answer six questions including Q. No. 1
which is compulsory**

The figures in the right-hand margin indicate marks

Symbols carry usual meaning

1. Answer all questions : 2 × 10

(a) Why do the microscopic particles obey quantum mechanics ?

(b) What type of information we obtain from the solution of Schrödinger wave equation ?

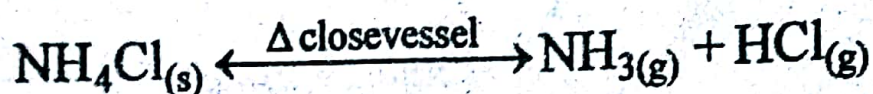
(c) How many type of energy are present in molecules ?

2×10

(Turn Over)

(d) Which law of thermodynamics says about entropy ?

(e) Calculate the phase, component and degree of freedom of following equilibrium :



(f) What is chemical potential ?

(g) Draw the phase diagram of water system.

(h) It is impossible to measure absolute value of single electrode potential, why ?

(i) What type of chain reaction causes explosion ?

(j) What is nano science ?

2. (a) Write the difference between classical mechanics and quantum mechanics. 5

(b) What is the significance of Schrödinger wave equation ? 5

3. (a) What is microwave ? Write the theory of microwave spectroscopy. 5

(b) The space between lines of rotational spectra of HBr is 16.94 cm^{-1} . Calculate the bond length of the molecule ($H = 1, Br = 80$). 5

4. (a) Write the significance of chemical potential. 5

(b) Using the definition of enthalpy, show that

$$\left(\frac{\partial T}{\partial P}\right)_S = \left(\frac{\partial V}{\partial S}\right)_P$$

5. (a) Draw the phase diagram of Fe-C system. 5

(b) Explain the Pb-Ag phase diagram. 5

6. (a) Explain how the pH of solution can be determined using glass electrode. 5

(b) What is dry cell? 5

7. (a) What is parallel reaction? Derive the kinetic equation of parallel reaction. 5

(b) What is corrosion? 5

(4)

8. Write short notes on (any two) :

5 + 5

(i) Galvanic corrosion

(ii) Consecutive reaction

(iii) Organometallic compound.

$\Delta P \cdot \Delta n = \frac{h}{4\pi}$