

COURSE CODE - 2030203

PG DEGREE EXAMINATION- JAN 2009

M.SC (CHEMISTRY)

PHYSICAL CHEMISTRY - I

(For the Candidates Admitted from Calendar 2007 onwards)

Time: 3 hours

Max. Marks: 75

Section-A

Answer all the Questions:

15 X 1=15

1. Define open system.
2. What is chemical potential?
3. An example of partial molal quantity is _____
4. What is overtone?
5. Define force constant.
6. Give an example of IR active molecule.
7. Point group of BF_3 molecule is _____
8. What is an order of a point group?
9. Structure of PCl_5 is _____
10. What is superconductor?
11. Give an example of n-type semiconductor.
12. What is F-centre?
13. Define enthalpy.
14. Entropy of a universe always _____
15. Give an example of a fast reaction.

Section – B

Answer any Five Questions:

5 X 6 = 30

16. a. Give an account of thermodynamic equation of state.

(Or)

- b. Derive Gibb's – Duhem equation.

17. a. Identify the symmetry elements present in the following cases and assign the point group

- i. Trans chloro ethylene ethylene
- ii. CO_2
- iii. H_2S

(Or)

- b. Using group theory explain the selection rules for Raman spectra.

18. a. Discuss Frank-condon principle with example.

(Or)

- b. Explain the origin of molecular spectra.

19. a. How will you construct the character table for C_{2v} point group?

(Or)

- b. Distinguish between insulators and conductors.

20. a. Explain the band theory of solids.

(Or)

- b. What is kinetic isotopic effect? Explain with example

Section – C

Answer any Two Questions:

2 X 15 = 30

21. Discuss the application of ARRT to bimolecular process.
22. State great orthogonality theorem. What are its consequences?
23. Discuss the types of defects in solids with examples.
24. Explain the variation of equilibrium constant with temperature and pressure.
25. Explain the Solid state chemistry in detail