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GDE-1775 Seat No._____

M. Sc. (Sem. I) Examination

January - 2016

Chemistry : CHN-404-A

(Group Theory & Spectroscopy)

Time : 3 Hours] [Total Marks :

1 Answer any five :

(a) Find out matrix of Cu symmetry element.

(b) Explain the great orthogonality theorem.

(c) Find out $\sqrt{3N}$ for following :

NH_3, $PtCl_4$, PCl_5, $XeOF_4$

(d) Discuss factors affecting intensities of spectral lines.

(e) Explain absorption, reflection, polarisation and scattering of light with mathematical expressions.

(f) Consider BF_3 (D_3h), find out $\boxed{\text{vibration}}$ $\boxed{\text{straching}}$ and $\boxed{\text{bending}}$.

(g) Explain the point group given by Sunfulize.

2 Answer any five :

(a) Explain the use of chemical shift in Mossbauer spectroscopy.

(b) Explain direct and reciprocal lattices.

(c) Discuss the Mossbauer spectra of Fe.

(d) What are quadrupole splitting ?

(e) Write a short note on Ramchandran diagram.

(f) Explain X-ray diffraction patterns of cubic system.

(g) Explain the Debye Schetter method.

3 Answer any five in brief :

(a) What is Bragg equation ?

(b) What are Mullikan symbols ?

(c) What is recoil energy ?

(d) What is Subgroup and Class ?

(e) Use of Mossbauer spectra.

(f) Definition of Isomer shift.

(g) Give various types of Symmetry Plane.