

**DK-117**

December-2017

M.Sc., Sem.-I

**401 : Inorganic Chemistry**

Time : 3 Hours]

[Max. Marks : 70

1. (A) Write a note on step-up and step-down operators. 7  
**OR**  
 Using variation method, calculate the eigen value for H-atom.  
 (B) Give a full account of spherical harmonics. 7  
**OR**  
 Calculate the first order correction term for the eigen function by using perturbation method.
2. (A) Explain the similarity transformations. 7  
**OR**  
 Explain the Great Orthogonality theorem.  
 (B) By using the wave functions as the bases for the irreducible representations, prepare the matrices for operations of  $\text{NH}_3$  molecule. 7  
**OR**  
 Write the characters of the representation of the following direct products and determine the irreducible representation which comprise them for the point group  
 $D_{3h} : A'_2 \times E'$
3. (A) Discuss Curie-Weiss Law. 7  
**OR**  
 Explain the "Pascal's constants" with example.  
 (B) Discuss Diamagnetism & Diamagnetic substance. 7  
**OR**  
 Write a note on Intermolecular antiferromagnetism.
4. (A) Write a note on Nitrogenase and its mechanism. 7  
**OR**  
 Write a note on discovery of Cisplatin, synthesis and mode of action.  
 (B) Write a note on cytochromes. 7  
**OR**  
 Write notes on (i) Gold compounds in arthritis and (ii) Metallocenes.

## 5. Answer in short :

- (i) When will you use the perturbation method ?
- (ii) Define angular momentum.
- (iii) What is a Hermitian operator ?
- (iv) On which principle does the simple harmonic oscillator operate ?
- (v) Define orthogonal matrix.
- (vi) What is the value of contribution to the character of  $\chi(C_4)$  per unshifted atoms in  $\Gamma_{3N}$  ?
- (vii) Write the reducible representation  $T_1 + E$  in  $T_d$  molecule.
- (viii) Explain the term Permeability.
- (ix) Give the characteristic properties of paramagnetism.
- (x) Write Lenz's law.
- (xi) Write the drawback of MRI.
- (xii) Write the characteristic of radioisotopes used in diagnostic purpose.
- (xiii) Explain the term Doming.
- (xiv) Write the structure of Silver sulphadiazine.

GujaratStudy.com

Whatsapp @ 9300930012

Send your old paper &amp; get 10/-

अपने पुराने पेपर्स भेजे और 10 रुपये पायें,

Paytm or Google Pay से