

Ph.D Course Work Examinations, July-2023

CHEMISTRY

Course-IV: Inorganic Chemistry and Nano Science

Time: 3 Hours

Max. Marks: 70

Instructions: All sections are compulsory

1. Answer any Seven the following questions 7x2M=14M
- Give the working principle of UV spectroscopy.
 - Write short note on alkyl metal complexes
 - What are trace metals? Give examples
 - Highlights the importance of Vitamin B12
 - Outline the steps involved in synthesis of nanomaterials by microwave method
 - Give working principle of AFM
 - Give brief account on dielectric properties of nanomaterials
 - List the applications of nanomaterials in defence.

- 2.
- Explain characterization of metal complexes using Mass Spectroscopy.
 - Describe MOT for metal complexes.
 - Give applications of NMR in materials characterization. 4+5+5=14M

OR

Discuss CFT of metal complexes

- 3.
- Describe the structure and importance of Vitamin B12.
 - Write a note on Vitamin-B12.
 - Give an account on Metalloproteins as enzymes. 4+5+5=14M

OR

Give applications of Synthetic model compounds.

- 4.
- Explain, synthesis of nanomaterials by combustion method.
 - Explain powder X-ray diffraction (PXRD) method in characterization of nanomaterials.
 - Describe the instrumentation of TEM. 5+5+4=14M

OR

Describe the instrumentation of SEM.

- 5.
- Write a note on optical properties of nanomaterials
 - Discuss photoluminescence properties of nanomaterials
 - Give applications of nanomaterials in medical field. 4+5+5=14M

OR

Describe the biotechnological applications of nanomaterials
