SEMESTER

Paper S-3044-A

Advanced Bio-inorganic chemistry

Time: 3 Hrs. **M.M. 75 marks**

Section-A One question with 10 parts (short answer word limit 20) spread over whole syllabus. Each part will be of 1 mark and candidate is required to attempt all the ten parts

Total 10 marks

Section-B Five questions (answer not exceeding 500 words) are from each Unit with internal choice will be asked and the candidate is required to attempt all five questions. Each question will be of 13 marks

Total 65 marks

UNIT-I

Fundamentals of inorganic biochemistry, geo-chemical effects on life systems essential and non-essential elements in bio-systems, Role of alkali/alkaline earth metals in bio-systems. Role of 3d block elements and nonmetals in bio-systems.

UNIT –II

Role of metal ions in oxygen carriers and synthetic oxygen carriers. Designing of chelating agents and metal chelates as medicines. Fixation of dinitrogen biologically and abiologically, biotransformation of nonmetallic inorganic compounds

UNIT-III

Environmental bioinorganic chemistry. Metal ions as probes for locating active sites. Anti-oxidants. Metal ions as antioxidants, metal ion enhancing catalytic activity of enzymes (Biocatalysts). Inhibitions as competitive and non-competitive metals and metalloproteins. Metal complexes of polynucleotides, nucleosides and nucleic acids(DNA & RNA) Template temperature, stability of DNA

UNIT-IV

Role of metal ions in replication and transcription process of nucleic acids, Biochemistry of dioxygen, bioinorganic chips and biosensors. Biochemistry of calcium as hormonal messenger, muscle contraction blood clotting neurotransmitter,

calcification reclaiming of barren land.

UNIT-V

Metals in the regulation of biochemical events. transport and storage of metal ions in vivo. Metal complexes as probes of structure and reactivity with metal substitution. Fundamentals of Toxicity and Detoxification, Nuclear medicines