

A-5/2110  
INORGANIC CHEMISTRY-II A  
SEMESTER-III  
(SYLLABUS DECEMBER-2018)

TIME ALLOWED 3 Hrs

M.M 26

NOTE: The candidates are required to attempt two questions each from Section A & B carrying 4 marks each and entire Section C consisting of 5 short answer type questions carrying 2 marks each.

SECTION – A

- I. (a) What are transition elements? Why transition metals give coloured and paramagnetic ions? (2)  
(b) The first ionisation energy of copper is higher than that of alkali metals while second ionisation energy is lower. Explain. (2)
- II. Explain dimeric structure of chromium(II)acetate monohydrate  $[\text{Cr}_2(\text{CH}_3\text{COO})_4] \cdot 2\text{H}_2\text{O}$  and compare it with that of Cu(II) acetate monohydrate. (4)
- III. (a) Chemistry of all lanthanides is so identical. Explain. (2)  
(b) How lanthanide ions are separated by ion exchange method? (2)
- IV. (a) La, Gd and Lu show only +3 oxidation state whereas other lanthanides exhibit +2 and +4 oxidation states. Why? (2)  
(b) Describe oxidising character of  $\text{KMnO}_4$  in acidic, basic and neutral medium. (2)

SECTION – B

- V. (a) Discuss the stereochemistry of complexes of second and third transition series in comparison of first transition series. (2)  
(b) Describe the structure of  $\text{Mo}_2(\text{OOCR})_4$ . (2)
- VI. (a) Compare the first transition series with respect to second and third transition series in relation with following properties:  
(i) Oxidation state (ii) Magnetic properties (3)  
(b) Why do elements of second and third transition series resemble each other much more closely than they resemble the first row? (1)
- VII. (a) What are transuranic elements? Give two examples. (2)  
(b) What is actinide contraction? (2)
- VIII. Discuss the chemistry of separation of Neptunium, Plutonium and Americium from Uranium. (4)

SECTION – C

- IX. (a) What is Prussian blue? How it is prepared? Discuss its structure.  
(b) Why lanthanides are called rare earth elements?  
(c) Out of Au(I) and Au(III) which undergoes disproportionation and why?  
(d) Lanthanides don't form oxocations. Explain.  
(e) Discuss magnetic properties of actinides. (2x5)