

M.Sc.(Chem.) Semester - 1 (CBCS) Examination
Jan/Feb.-2022 [NEW COURSE]
INORGANIC CHEMISTRY(CORE)

Time: 1:30 Hours

Marks: 42

Instructions:

1. Figures to the right indicate marks.
2. There are five questions in the question paper.
3. Answer any three of the following questions.

Q.1 (a)	Answer the following	4 Marks
(1)	Briefly explain bonding in N_2O and Na_2O .	2
(2)	Calculate average bond order of NO_3^- .	2
Q.1 (b)	Answer any two questions out of three.	10 Marks
(1)	Discuss the Walsh diagram in detail.	5
(2)	Discuss the stability of O_2 , O_2^+ and O_2^- based on MOT.	5
(3)	Explain ClF_5 molecule based on VBT and VSEPR.	5
Q.2 (a)	Answer the following.	4 Marks
(1)	Complete the following reactions. (i) $4KO_2 + 4H_2O \rightarrow ?$ (ii) $CaSO_4 + Na_2CO_3 \rightarrow ?$ (iii) $BaSO_4 + 4C \rightarrow ?$ (iv) $2Al + Cr_2O_3 \rightarrow ?$	4
Q.2 (b)	Answer any two questions out of three.	10 Marks
(1)	What is catenation? Discuss the catenation and bonding in group-14.	5
(2)	Explain the hydride and oxides of group-15.	5
(3)	Discuss the chemical properties of noble gases.	5
Q.3 (a)	Answer the following.	4 Marks
(1)	Give the IUPAC Name of: (a) $[Pt(NH_3)_4(ONO)Cl]$ (b) $[Cr(H_2O)_4Br_2]Br \cdot 2H_2O$ (c) $K[MnO_4]$ (d) $Na_3[Co(NO_2)_6]$	4
Q.3 (b)	Answer any two questions out of three.	10 Marks
(1)	Discuss the geometrical isomerism in 6 C.N. compounds.	5
(2)	Explain transition and spectra in $d1$ and $d6$ configuration in O_h and T_d high spin complex.	5
(3)	Discuss the electronic spectra of transition metal complexes.	5
Q.4 (a)	Answer the following.	4 Marks
(1)	Explain electronic effect of inert ligands.	4
Q.4 (b)	Answer any two questions out of three.	10 Marks
(1)	What is electron transfer reaction? Explain in detail.	5
(2)	Discuss $SN1$ and $SN2$ reaction in 6 C.N. complexes.	5
(3)	Discuss the trans effect in metal complex with suitable example.	5
Q.5 (a)	Answer the following	4 Marks
(1)	Write a condition for recoilless emission in MB spectra.	4
Q.5 (b)	Answer any two questions out of three.	10 Marks
(1)	Discuss the use of MB Spectra in Prussian Blue and Turnbull's Blue .	5
(2)	Explain the structural identification of metal carbonyl by use of MB Spectra.	5
(3)	Write a note on isomer shift and quadrupole splitting in MB Spectra.	5
