



Sri Chaitanya IIT Academy, India

A.P, TELANGANA, KARNATAKA, TAMILNADU, MAHARASHTRA, DELHI, RANCHI

A right Choice for the Real Aspirant

ICON CENTRAL OFFICE, MADHAPUR-HYD

Sec: Sr. IPLCO

JEE ADVANCED

DATE : 08-11-15

TIME : 02:00 AM TO 05:00 PM

2013_P2 MODEL

MAX MARKS : 180

KEY & SOLUTIONS

PHYSICS

1	B	2	AB	3	BCD	4	ABC	5	ABC
6	ABD	7	ACD	8	BCD	9	B	10	A
11	B	12	B	13	C	14	B	15	A
16	D	17	D	18	B	19	C	20	A

CHEMISTRY

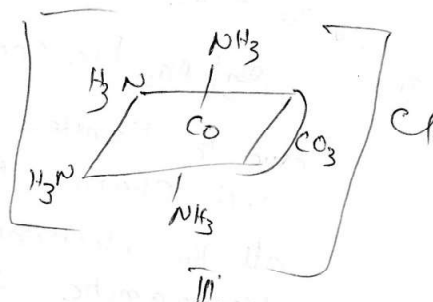
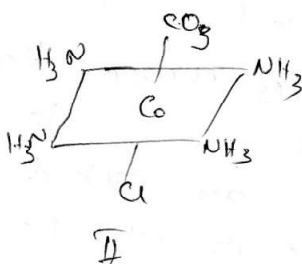
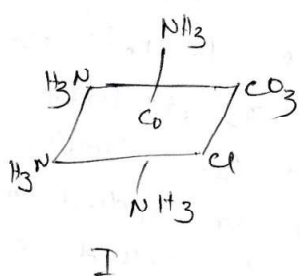
21	ABC	22	BCD	23	ABCD	24	BCD	25	ABCD
26	ABC	27	ABCD	28	ABCD	29	B	30	C
31	C	32	C	33	C	34	B	35	A
36	C	37	C	38	A	39	D	40	B

MATHEMATICS

41	AC	42	ABC	43	ABD	44	BC	45	ABD
46	ABCD	47	ABCD	48	ABD	49	C	50	B
51	B	52	C	53	A	54	B	55	A
56	D	57	D	58	A	59	D	60	C

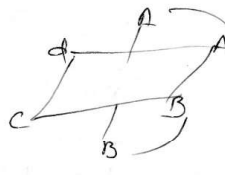
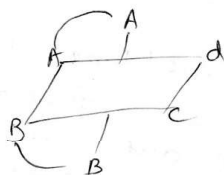
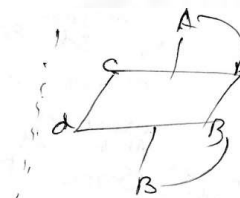
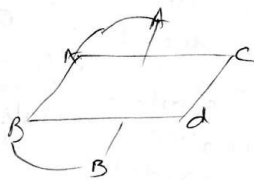
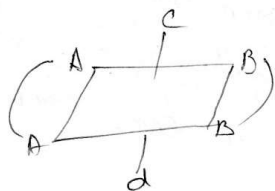
CHEMISTRY

21. In the formation of $\text{Na}_2[\text{Fe}(\text{CN})_5\text{NO}]$, Fe is in +3 oxidation state, but due to transfer of electron from NO to Fe^{3+} its oxidation state changes to Fe^{2+} . In the d^6 configuration of Fe^{2+} all the electrons are paired and the complex is diamagnetic. So its wt. decreases in applied magnetic field due to repulsion. It is also called sodium nitroprusside used in the detection of S^{2-} ion which give purple colour.
22. The common oxidation state is +2. Its stability increases from left to right in a series. In 3d series after Cr the atomic radius does not change much. Repulsion between paired electrons cancels the poor shielding effect of d-electrons. At the end the repulsions of electron pairs become more. So some size increases slightly transition metals like Ni, Fe, Cr may show zero oxidation state in some compounds like carbonyls
23. Due to poor shielding effect of d-electrons the atomic sizes of transition metals will become less than IA and IIA group elements. Due to lanthanide contraction the atomic and ionic sizes of 2nd and 3rd transition elements are almost same.
24. In the oxides of an element acidic nature increases while basic nature decreases with increase in oxidation number. When an oxide dissolve in non oxidising acid generally it exist as aqua complex with CN 6. Oxides like V_2O_5 , CrO_3 , Mn_2O_7 , etc NaVO_3 , $\text{Na}_2\text{Cr}_2\text{O}_7$, KMnO_4 , etc.

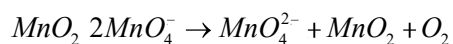


25. III gives ppt with AgNO_3 in which CO_3 is acting as bidentate ligand. I and II do not give ppt with AgNO_3

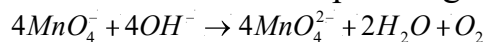
26.



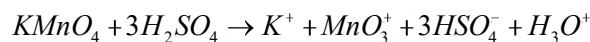
27. $KMnO_4$ slowly decomposes in aqueous solution depositing brown



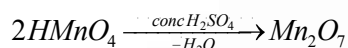
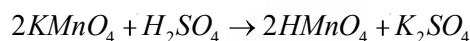
In concentrated alkali permanganates give manganates.



If a small quantity of $KMnO_4$ is added to *conc.* H_2SO_4 , a green solution containing MnO_3^+ ions are formed



With larger amounts of $KMnO_4$ an explosive oil Mn_2O_7 is formed.



28. When CN^- is added to aq. Solution of Ni which contain $[Ni(H_2O)_6]^{2+}$; $[Ni(CN)_4]^{2-}$ is formed. $[Ni(H_2O)_6]^{2+}$ is outer orbital complex with two unpaired electrons

have green colour. But $[Ni(CN)_4]^{2-}$ have all the electrons paired. So colourless

B) With increase in strength of ligand Δ_o increases

C) N donor NO_2^- is stronger than o-donor NO_2

29. EAN of $V(23)$ in $V(CO)_5$ is 35

30. As the instability constant of $[Fe(CN)_6]^{3-}$ is least, it is most stable.

31,32.

The compound that can liberate I_2 from KI is $CuSO_4$. Converting into Cu_2I_2

33. Since i is 1-3 the overall stability constant is $\log \beta_3$

34. Due to increase in the number of ligands substituted by bidentate ligands the entropy increases

35. Since the isomer is suffering loss of weight with *conc.* H_2SO_4 , it should be hydrated isomer. Because it is giving yellow ppt with $AgNO_3$, I^- ions are in the ionization sphere. Then the complex will be $[Co(en)_2Cl_2]I.H_2O$. In this complex cobalt is in +3 oxidation state when CN^- ion replaces all the ligands, it will become inner orbital complex with all electrons paired. So magnetic moment will be zero. Since the Cl^- ions are inside the coordination sphere they will not be precipitated as white $PbCl_2$.