

OR

(i) $SiCl_4$ does not act as Lewis acid while $SnCl_4$ does so. Why?

does not act as Lewis acid while and do so. Why?

(r) Strong oxidising agent do not exist in liq. NH_3 . Give reason.

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Code No. : B-237(B)

Annual Examination - 2017

B.Sc.-II

CHEMISTRY

Paper-I

INORGANIC CHEMISTRY

Max.Marks : 33

Time : 3 Hrs.

Min Marks : 11

Section 'A' containing 8 very short answer type questions, is compulsory. Section 'B' consists of short answer type questions and Section 'C' consists of long answer type questions. Section 'A' has to be solved first.

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Section-'A'

(Answer the following very short-answer-type questions in one or two lines.) (1x8=8)

1. Re(IV) Write the electronic configuration of . Atomic number of .

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2. Calculate the spin magnetic moment of V^{3+} ion .

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Zālā-3. Fe^{2+} and Fe^{3+} have similar properties. Why?

and have similar properties. Why?

Zālā-4. "Zālā-4. Fe^{2+} and Fe^{3+} have similar properties. Why?"

Write the formula of prussian blue, write the oxidation state of metal present in the formula.

Zālā-5. Fe^{2+} and Fe^{3+} have similar properties. Why?

What is disproportionation reaction? Give one example.

Zālā-6. Fe^{2+} and Fe^{3+} have similar properties. Why?

What is chelate? Give one example.

Zālā-7. Fe^{2+} and Fe^{3+} have similar properties. Why?

is more basic than . Why?

Zālā-8. Fe^{2+} and Fe^{3+} have similar properties. Why?"

Acidic nature of halides of Boron are as follows $\text{BBr}_3 > \text{BCl}_3 > \text{BF}_3$, Explain.

h/2-r'(Section-'B')

Answer the following short-answer type questions with word limit 150-200 (5x2=10)

Zālā-1. (i) Fe^{2+} and Fe^{3+} have similar properties. Why?

Transition metals are less reactive than alkali metals. Why?

(r) Mn^{2+} and Fe^{2+} which one has larger magnetic moment?

Among and which one has larger magnetic moment?

(r) Fe^{2+} and Fe^{3+} have similar properties. Why?

i) Fe^{2+} and Fe^{3+} have similar properties. Why?

ii) Fe^{2+} and Fe^{3+} have similar properties. Why?

Explain the following :

i) Co-ordination isomerism

ii) Hydrate isomerism

Zālā-4. Ce^{3+} and Ce^{4+} have similar properties. Why?

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r) Ce^{3+} and Ce^{4+} have similar properties. Why?"

Explain the following :

a) Cerium exhibits +4 oxidation state.

b) Lanthanides are called rare earth elements and inner transition elements.

OR

(i) Ce^{3+} and Ce^{4+} have similar properties. Why?

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ii) Ce^{3+} and Ce^{4+} have similar properties. Why?"

Explain the following :

i) Lanthanide contraction

ii) Similarities between post lanthanides and post actinides.

(r) Ce^{3+} and Ce^{4+} have similar properties. Why?"

Explain relation of dipole moment and dielectric constant of a solvent.

r) $\text{S}^{\text{a}}\text{a y}^{\text{S}}\text{t}^{\text{1}}\text{a o}\text{m}\text{a} \text{ o}\text{m}\text{a} \text{ r}^{\text{b}} \text{ r}^{\text{a}}\text{a} \text{ t}^{\text{e}}\text{; } \text{a} \text{ o}\text{S}^{\text{y}} \text{E}\text{A}^{\text{t}}\text{h} \text{N}\text{a}^{\text{n}}$

The heavier transition metals are more prone to metal-metal bonding. Explain.

OR

ytI aY (Explain) B

i) 'Hg' S¹zant i auA S¹1/2 a yKa S¹a ta a yci a oS¹Na ma Neñ

1st ionisation energy of 'Hg' is higher than that of

r) Zant yS¹t¹/2 o¹za S¹y yS¹v t a umB Na t e DQa Na n c Na k r a S¹y a o m a u w l m a u y S¹t¹/2 o¹za S¹y y S¹v (v a DQa) Na n c Na n

Complexes of 1st transition series are mainly high spin while those of second and third transition series are of low spin.

ZaA-3. (i) 'q a r c y i a h y w a t i a h N a - c y S y n a S y l q a p S y l a k y n

'Pourbaix diagram is the best diagram.' - Justify this statement.

(r) w A e S y E q - y n y l u a k S y m a a y = a m S y a w / a a S y l a k y n E A a N E / a y a l m Z a n a t S y m n a a o m a u S y y l u a k S y m a y t l a y n

Explain Werner's theory of co-ordination. What is primary and secondary valency? Explain with example.

OR

(i) A g a p i a h S y c y t l a y n

Explain Frost diagram.

OR

(i) S y y v A u a S y i l v t e i a e y a S y a S y a y t l a y n

Explain the oxidising ability of _____ in sulphuric acid.

(r) i a u E a y S y y S t 1 / 2 o a m a N e y a p u t A a l a n i u a p

Iron is a transition metal but Sodium is not. Why?

ZaA-2. u u a w w p u u a a n y a a u t y c i a q u a y t l m c n e ?

What do you understand by Curie and Curie-Weiss law?

OR

m a u y S t 1 / 2 o 1 z a S y m w a S y a a a u t E y a u a y t l a y n

Explain the stereo-chemistry of elements of 3rd transition series.

[Co(NH₃)₆]³⁺ 3 o m w a S y a l S y x e t a l a l m a y = a m a S y l l u a u a S y l a k y n

Explain the principle involved in the extraction of metals.

OR

y l u a k S y m a r b S y i a o e q e a l l a v a m u a a S y S y l y E j a y t l a y n :

i)

(r) [MnBr₄]²⁻ ion

Explain the structure of the following compounds on the basis of Valence bond theory :

a) [Co(NH₃)₆]³⁺ ion

b) [MnBr₄]²⁻ ion

ZaA-4. v a n a t p p S y q a S y E 1 / 2 S y l i a u a a v a t u a n a o S y a w / a a S y l a k y n

Describe the ion-exchange method for separation of lanthanides.

OR

What are actinide elements? Write the electronic configuration of actinide elements and discuss their important oxidation states.

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Q.5. Select Lewis acids and bases from the following :

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- i) ii) iii) iv) v) vi)

OR

Q.6. The order of expected strength of oxyacids is as follows :

$HNO_2 > HNO_3 > HClO_2 > HClO$

The order of expected strength of oxyacids is as follows :

$HI > HBr > HCl > HF$

The order of expected strength of hydro acids is as follows :

$$HI > HBr > HCl > HF$$

Section-'C'

Q.7. Answer the following long-answer type questions with word limit 300-350 (5x3=15)

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Q.7(i). What are various oxidation states of and ?

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Q.7(ii). Transition metals are good catalysts. Explain.

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Q.7(iii). is more stable than . Explain.

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OR

Q.8. Explain the general characteristics of 'd' block elements with respect to : i) Size ii) Variable oxidation state iii) Ionisation energy

i) Size ii) Variable oxidation state

iii) Ionisation energy

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- i) Size ii) Variable oxidation state iii) Ionisation energy

Q.9. Elements of second and third transition series exhibit catalytic properties.

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