

Test: Chemistry (Entrance examination)

**Question # 1. Atomic structure**

Choose two elements, which being in basic state, **do not have** unpaired electrons.  
Select correct answers

N  F  C  Ne  Be

**Question # 2. Atomic structure**

Of the following, choose two elements that **cannot have** positive oxidation number.  
Select correct answers

N  C  Be  F  Ne

**Question # 3. Atomic structure**

Of the following, choose three elements that can form oxides. Put these elements in the order of decrease of acidity of their higher oxides.

For correct answer set order

N  Be  Ne  F  C

**Question # 4. Properties of amphoteric hydroxides, acids and salts.**

A solution of sodium hydro carbonate was placed in two test tubes. A solution of a substance X was added to the first tube which led to the release of a gas. A solution of a substance Y was added to the second tube which led to the formation of a precipitate. Of the following substances, decide which substances are X and Y.

For correct answer set order

sulfuric acid  sodium hydroxide  barium hydroxide   
sodium carbonate  calcium nitrate

**Question # 5. Classification and nomenclature of inorganic substances.**

Match the following compound with its class/group. Choose the appropriate group for every given formula.

$Al(OH)_3$

salts  amphoteric hydroxides  basic hydroxide  acidic hydroxides  oxides

$Ca(OH)_2$

salts  amphoteric hydroxides  basic hydroxide  acidic hydroxides  oxides

$Zn(OH)_2$

salts  amphoteric hydroxides  basic hydroxide  acidic hydroxides  oxides

**Question # 6. Chemical bonds**

Of the following, choose two compounds whose molecules have only covalent bonds.

Select correct answers

$C_6H_5NO_2$    $NH_4Cl$    $KSCN$    $SOCl_2$

$Mg(NO_3)_2$

**Question # 7. Properties of simple substances and oxides.**

Of the following, choose two substances that can react with both sodium and chlorine.

Select correct answers

water  calcium oxide  oxygen  phosphorus  carbon oxide(IV)

**Question # 8. Classification and nomenclature of organic compounds**

Match the following compounds with its class/group. Choose the appropriate group for every given compound.

benzene

alcohols  dienes  amino acids  aldehydes  alkynes  arenes

2Propanol

alcohols  dienes  amino acids  aldehydes  alkynes  arenes  
alanine

alcohols  dienes  amino acids  aldehydes  alkynes  arenes

ethine

alcohols  dienes  amino acids  aldehydes  alkynes  arenes

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### Question # 9. Interrelation of various classes of inorganic substances

Match the following reagents with the products of their reactions

$\text{Fe}_3\text{O}_4$  ~and~  $\text{HNO}_3$  ~\_{(concentrated)}  $\text{Fe}_3\text{O}_4$  and  $\text{HNO}_3$  (concentrated)

- $\text{CuCl}_2$  ~and~  $\text{FeCuCl}_2$  and  $\text{Fe}$
- $\text{Fe}$ ,  $\text{O}_2$ , ~and~  $\text{H}_2\text{O}$   $\text{Fe}$ ,  $\text{O}_2$ , and  $\text{H}_2\text{O}$
- $\text{Fe}(\text{NO}_3)_3$ ,  $\text{NO}_2$  ~and~  $\text{H}_2\text{O}$   $\text{Fe}(\text{NO}_3)_3$ ,  $\text{NO}_2$  and  $\text{H}_2\text{O}$
- $\text{Fe}(\text{OH})_3$   $\text{Fe}(\text{OH})_3$
- $\text{FeCl}_2$  ~and~  $\text{CuCl}_2$   $\text{FeCl}_2$  and  $\text{CuCl}_2$
- $\text{Fe}(\text{NO}_3)_3$  ~and~  $\text{H}_2\text{O}$   $\text{Fe}(\text{NO}_3)_3$  and  $\text{H}_2\text{O}$

$\text{Fe}(\text{OH})_2$  ~and~  $\text{H}_2\text{O}$   $\text{Fe}(\text{OH})_2$  and  $\text{H}_2\text{O}$

- $\text{CuCl}_2$  ~and~  $\text{FeCuCl}_2$  and  $\text{Fe}$
- $\text{Fe}$ ,  $\text{O}_2$ , ~and~  $\text{H}_2\text{O}$   $\text{Fe}$ ,  $\text{O}_2$ , and  $\text{H}_2\text{O}$
- $\text{Fe}(\text{NO}_3)_3$ ,  $\text{NO}_2$  ~and~  $\text{H}_2\text{O}$   $\text{Fe}(\text{NO}_3)_3$ ,  $\text{NO}_2$  and  $\text{H}_2\text{O}$
- $\text{Fe}(\text{OH})_3$   $\text{Fe}(\text{OH})_3$
- $\text{FeCl}_2$  ~and~  $\text{CuCl}_2$   $\text{FeCl}_2$  and  $\text{CuCl}_2$
- $\text{Fe}(\text{NO}_3)_3$  ~and~  $\text{H}_2\text{O}$   $\text{Fe}(\text{NO}_3)_3$  and  $\text{H}_2\text{O}$

$\text{FeCl}_3$  ~and~  $\text{CuFeCl}_3$  and  $\text{Cu}$

- $\text{CuCl}_2$  ~and~  $\text{FeCuCl}_2$  and  $\text{Fe}$
- $\text{Fe}$ ,  $\text{O}_2$ , ~and~  $\text{H}_2\text{O}$   $\text{Fe}$ ,  $\text{O}_2$ , and  $\text{H}_2\text{O}$
- $\text{Fe}(\text{NO}_3)_3$ ,  $\text{NO}_2$  ~and~  $\text{H}_2\text{O}$   $\text{Fe}(\text{NO}_3)_3$ ,  $\text{NO}_2$  and  $\text{H}_2\text{O}$
- $\text{Fe}(\text{OH})_3$   $\text{Fe}(\text{OH})_3$
- $\text{FeCl}_2$  ~and~  $\text{CuCl}_2$   $\text{FeCl}_2$  and  $\text{CuCl}_2$
- $\text{Fe}(\text{NO}_3)_3$  ~and~  $\text{H}_2\text{O}$   $\text{Fe}(\text{NO}_3)_3$  and  $\text{H}_2\text{O}$

$\text{FeO}$  ~and~  $\text{HNO}_3$  ~\_{(concentrated)}  $\text{FeO}$  and  $\text{HNO}_3$  (concentrated)

- $\text{CuCl}_2$  ~and~  $\text{FeCuCl}_2$  and  $\text{Fe}$
- $\text{Fe}$ ,  $\text{O}_2$ , ~and~  $\text{H}_2\text{O}$   $\text{Fe}$ ,  $\text{O}_2$ , and  $\text{H}_2\text{O}$
- $\text{Fe}(\text{NO}_3)_3$ ,  $\text{NO}_2$  ~and~  $\text{H}_2\text{O}$   $\text{Fe}(\text{NO}_3)_3$ ,  $\text{NO}_2$  and  $\text{H}_2\text{O}$
- $\text{Fe}(\text{OH})_3$   $\text{Fe}(\text{OH})_3$
- $\text{FeCl}_2$  ~and~  $\text{CuCl}_2$   $\text{FeCl}_2$  and  $\text{CuCl}_2$
- $\text{Fe}(\text{NO}_3)_3$  ~and~  $\text{H}_2\text{O}$   $\text{Fe}(\text{NO}_3)_3$  and  $\text{H}_2\text{O}$

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### Question # 10. Ion exchange and dissociation

Match the following reagents with the net ionic equations of their reactions.

$\text{AgNO}_3$  ~and~  $\text{KCl}$   $\text{AgNO}_3$  and  $\text{KCl}$

- $2\text{H}^+ + \text{CO}_3^{2-} = \text{CO}_2 + \text{H}_2\text{O}$   $2\text{H}^+ + \text{CO}_3^{2-} = \text{CO}_2 + \text{H}_2\text{O}$
- $\text{K}^+ + \text{Cl}^- = \text{KCl}$   $\text{K}^+ + \text{Cl}^- = \text{KCl}$
- $\text{Fe}^{3+} + \text{PO}_4^{3-} = \text{FePO}_4$   $\text{Fe}^{3+} + \text{PO}_4^{3-} = \text{FePO}_4$
- $\text{CaCO}_3 + 2\text{H}^+ = \text{Ca}^{2+} + \text{CO}_2 + \text{H}_2\text{O}$   $\text{CaCO}_3 + 2\text{H}^+ = \text{Ca}^{2+} + \text{CO}_2 + \text{H}_2\text{O}$
- $\text{Ca}^{2+} + 2\text{Cl}^- = \text{CaCl}_2$   $\text{Ca}^{2+} + 2\text{Cl}^- = \text{CaCl}_2$
- $\text{Ag}^+ + \text{Cl}^- = \text{AgCl}$   $\text{Ag}^+ + \text{Cl}^- = \text{AgCl}$
- $\text{Mg}^{2+} + 2\text{F}^- = \text{MgF}_2$   $\text{Mg}^{2+} + 2\text{F}^- = \text{MgF}_2$   
 Mg(NO<sub>3</sub>)<sub>2</sub> ~and~ NaF Mg(NO<sub>3</sub>)<sub>2</sub> and NaF
- $2\text{H}^+ + \text{CO}_3^{2-} = \text{CO}_2 + \text{H}_2\text{O}$   $2\text{H}^+ + \text{CO}_3^{2-} = \text{CO}_2 + \text{H}_2\text{O}$
- $\text{K}^+ + \text{Cl}^- = \text{KCl}$   $\text{K}^+ + \text{Cl}^- = \text{KCl}$
- $\text{Fe}^{3+} + \text{PO}_4^{3-} = \text{FePO}_4$   $\text{Fe}^{3+} + \text{PO}_4^{3-} = \text{FePO}_4$
- $\text{CaCO}_3 + 2\text{H}^+ = \text{Ca}^{2+} + \text{CO}_2 + \text{H}_2\text{O}$   $\text{CaCO}_3 + 2\text{H}^+ = \text{Ca}^{2+} + \text{CO}_2 + \text{H}_2\text{O}$
- $\text{Ca}^{2+} + 2\text{Cl}^- = \text{CaCl}_2$   $\text{Ca}^{2+} + 2\text{Cl}^- = \text{CaCl}_2$
- $\text{Ag}^+ + \text{Cl}^- = \text{AgCl}$   $\text{Ag}^+ + \text{Cl}^- = \text{AgCl}$
- $\text{Mg}^{2+} + 2\text{F}^- = \text{MgF}_2$   $\text{Mg}^{2+} + 2\text{F}^- = \text{MgF}_2$   
 CaCO<sub>3</sub> ~and~ HCl CaCO<sub>3</sub> and HCl
- $2\text{H}^+ + \text{CO}_3^{2-} = \text{CO}_2 + \text{H}_2\text{O}$   $2\text{H}^+ + \text{CO}_3^{2-} = \text{CO}_2 + \text{H}_2\text{O}$
- $\text{K}^+ + \text{Cl}^- = \text{KCl}$   $\text{K}^+ + \text{Cl}^- = \text{KCl}$
- $\text{Fe}^{3+} + \text{PO}_4^{3-} = \text{FePO}_4$   $\text{Fe}^{3+} + \text{PO}_4^{3-} = \text{FePO}_4$
- $\text{CaCO}_3 + 2\text{H}^+ = \text{Ca}^{2+} + \text{CO}_2 + \text{H}_2\text{O}$   $\text{CaCO}_3 + 2\text{H}^+ = \text{Ca}^{2+} + \text{CO}_2 + \text{H}_2\text{O}$
- $\text{Ca}^{2+} + 2\text{Cl}^- = \text{CaCl}_2$   $\text{Ca}^{2+} + 2\text{Cl}^- = \text{CaCl}_2$
- $\text{Ag}^+ + \text{Cl}^- = \text{AgCl}$   $\text{Ag}^+ + \text{Cl}^- = \text{AgCl}$
- $\text{Mg}^{2+} + 2\text{F}^- = \text{MgF}_2$   $\text{Mg}^{2+} + 2\text{F}^- = \text{MgF}_2$   
 K<sub>3</sub>PO<sub>4</sub> ~and~ FeCl<sub>3</sub> K<sub>3</sub>PO<sub>4</sub> and FeCl<sub>3</sub>
- $2\text{H}^+ + \text{CO}_3^{2-} = \text{CO}_2 + \text{H}_2\text{O}$   $2\text{H}^+ + \text{CO}_3^{2-} = \text{CO}_2 + \text{H}_2\text{O}$
- $\text{K}^+ + \text{Cl}^- = \text{KCl}$   $\text{K}^+ + \text{Cl}^- = \text{KCl}$
- $\text{Fe}^{3+} + \text{PO}_4^{3-} = \text{FePO}_4$   $\text{Fe}^{3+} + \text{PO}_4^{3-} = \text{FePO}_4$
- $\text{CaCO}_3 + 2\text{H}^+ = \text{Ca}^{2+} + \text{CO}_2 + \text{H}_2\text{O}$   $\text{CaCO}_3 + 2\text{H}^+ = \text{Ca}^{2+} + \text{CO}_2 + \text{H}_2\text{O}$
- $\text{Ca}^{2+} + 2\text{Cl}^- = \text{CaCl}_2$   $\text{Ca}^{2+} + 2\text{Cl}^- = \text{CaCl}_2$
- $\text{Ag}^+ + \text{Cl}^- = \text{AgCl}$   $\text{Ag}^+ + \text{Cl}^- = \text{AgCl}$
- $\text{Mg}^{2+} + 2\text{F}^- = \text{MgF}_2$   $\text{Mg}^{2+} + 2\text{F}^- = \text{MgF}_2$

**Question # 11. Properties of inorganic substances**

Match the following formulas with the series of reagents where there are only reagents the given substance can react with.

LiOH ~\_{(solution)} LiOH (solution)

- MgO, ~ Ca(OH)<sub>2</sub>, ~ H<sub>2</sub>O MgO, Ca(OH)<sub>2</sub>, H<sub>2</sub>O
- NaHCO<sub>3</sub>, ~ HBr, ~ KHSO<sub>4</sub> NaHCO<sub>3</sub>, HBr, KHSO<sub>4</sub>
- KOH, ~ O<sub>2</sub>, ~ HCl KOH, O<sub>2</sub>, HCl
- NaOH, ~ Zn, ~ AgNO<sub>3</sub> NaOH, Zn, AgNO<sub>3</sub>
- O<sub>2</sub>, ~ NaOH, ~ Cl<sub>2</sub> O<sub>2</sub>, NaOH, Cl<sub>2</sub>

CuBr<sub>2</sub> ~ (solution) } CuBr<sub>2</sub> (solution)

- MgO, ~ Ca(OH)<sub>2</sub>, ~ H<sub>2</sub>O, MgO, Ca(OH)<sub>2</sub>, H<sub>2</sub>O
- NaHCO<sub>3</sub>, ~ HBr, ~ KHSO<sub>4</sub>, NaHCO<sub>3</sub>, HBr, KHSO<sub>4</sub>
- KOH, ~ O<sub>2</sub>, ~ HCl, KOH, O<sub>2</sub>, HCl
- NaOH, ~ Zn, ~ AgNO<sub>3</sub>, NaOH, Zn, AgNO<sub>3</sub>
- O<sub>2</sub>, ~ NaOH, ~ Cl<sub>2</sub>, NaOH, Cl<sub>2</sub>

Si

- MgO, ~ Ca(OH)<sub>2</sub>, ~ H<sub>2</sub>O, MgO, Ca(OH)<sub>2</sub>, H<sub>2</sub>O
- NaHCO<sub>3</sub>, ~ HBr, ~ KHSO<sub>4</sub>, NaHCO<sub>3</sub>, HBr, KHSO<sub>4</sub>
- KOH, ~ O<sub>2</sub>, ~ HCl, KOH, O<sub>2</sub>, HCl
- NaOH, ~ Zn, ~ AgNO<sub>3</sub>, NaOH, Zn, AgNO<sub>3</sub>
- O<sub>2</sub>, ~ NaOH, ~ Cl<sub>2</sub>, NaOH, Cl<sub>2</sub>

SO<sub>3</sub>

- MgO, ~ Ca(OH)<sub>2</sub>, ~ H<sub>2</sub>O, MgO, Ca(OH)<sub>2</sub>, H<sub>2</sub>O
- NaHCO<sub>3</sub>, ~ HBr, ~ KHSO<sub>4</sub>, NaHCO<sub>3</sub>, HBr, KHSO<sub>4</sub>
- KOH, ~ O<sub>2</sub>, ~ HCl, KOH, O<sub>2</sub>, HCl
- NaOH, ~ Zn, ~ AgNO<sub>3</sub>, NaOH, Zn, AgNO<sub>3</sub>
- O<sub>2</sub>, ~ NaOH, ~ Cl<sub>2</sub>, NaOH, Cl<sub>2</sub>

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#### Question # 12. Properties of hydrocarbons.

Of the following, choose two compounds that react with water according to Markovnikov's Rule  
Select correct answers

- propene
- 2-butene
- ethene
- 2-methyl-2-butene
- 2,3-dimethyl-2-butene

Save

#### Question # 13. Properties of oxygen containing compounds.

Of the following, choose two compounds that can react with 1,2-ethanediol.  
Select correct answers

- hydrogen
- diethyl ether
- copper hydroxide(II)
- nitric acid
- nitrogen

Save

Question # 14. The reaction rate and its dependence on different factors.

Of the following, choose two factors that increase the rate of the reaction between copper sulfate (II) and sodium sulfide.

Select correct answers

- decrease of temperature
- increase of copper sulfate(II) concentration
- increase of sodium sulfide concentration
- increase of pressure in the system
- usage of an inhibitor

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Question # 15. Oxidation-reduction reactions.

Match the following oxidation-reduction reactions schemes with the reducing agents of the reactions.

$\text{NO}_2 + \text{O}_2 + \text{H}_2\text{O} \rightarrow \text{HNO}_3 + \text{NO}_2 + \text{H}_2\text{O} \rightarrow \text{HNO}_3$

HNO<sub>3</sub> HNO<sub>3</sub>    Cu Cu    NO<sub>2</sub> NO<sub>2</sub>    O<sub>2</sub> O<sub>2</sub>    NH<sub>3</sub> NH<sub>3</sub>    H<sub>2</sub>O H<sub>2</sub>O  
 $\text{HNO}_3 + \text{Cu} \rightarrow \text{Cu}(\text{NO}_3)_2 + \text{NO} + \text{H}_2\text{O}$   
 $\text{HNO}_3 + \text{Cu} \rightarrow \text{Cu}(\text{NO}_3)_2 + \text{NO} + \text{H}_2\text{O}$

HNO<sub>3</sub> HNO<sub>3</sub>    Cu Cu    NO<sub>2</sub> NO<sub>2</sub>    O<sub>2</sub> O<sub>2</sub>    NH<sub>3</sub> NH<sub>3</sub>    H<sub>2</sub>O H<sub>2</sub>O  
 $\text{NH}_3 + \text{O}_2 \rightarrow \text{N}_2 + \text{H}_2\text{O}$   
 $\text{NH}_3 + \text{O}_2 \rightarrow \text{N}_2 + \text{H}_2\text{O}$

HNO<sub>3</sub> HNO<sub>3</sub>    Cu Cu    NO<sub>2</sub> NO<sub>2</sub>    O<sub>2</sub> O<sub>2</sub>    NH<sub>3</sub> NH<sub>3</sub>    H<sub>2</sub>O H<sub>2</sub>O

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**Question # 16. The theory of the chemical structure of organic compounds**

Of the following, choose two compounds that are isomers of each other.

Select correct answers

- $\text{CH}_3\text{C}(\text{O})\text{NHCH}_2\text{CH}_2\text{C}(\text{O})\text{NHCH}_3$    $\text{CH}_3\text{CH}_2\text{CH}_2\text{NO}_2$    $\text{CH}_3\text{CH}_2\text{CH}_2\text{NO}_2$
- $\text{CH}_3\text{CH}_2\text{NH}_2$    $\text{CH}_3\text{CH}_2\text{NH}_2$    $\text{H}_2\text{NCH}_2\text{COOH}$    $\text{H}_2\text{NCH}_2\text{COOH}$
- $\text{CH}_3\text{CH}(\text{NH}_2)\text{COOH}$    $\text{CH}_3\text{CH}(\text{NH}_2)\text{COOH}$

**Question # 17. Properties of nitrogen containing compounds.**

Of the following, choose two compounds that **cannot react** with aminoacetic acid.

Select correct answers

- sodium hydroxide  dimethyl ether  isobutane  hydrochloric acid  magnesium

**Question # 18. Classification of chemical reactions in organic and inorganic chemistry.**

Of the following, choose two types of reactions that can describe the reaction between hydrogen and formaldehyde.

Select correct answers

- alkaline hydrolysis  catalytic reaction  neutralisation reaction  hydration reaction
- hydrogenation reaction

**Question # 19. Hydrolysis of salts.**

Match the following salts with the type of the hydrolysis of these salts in water solution

ammonium chloride

- does not hydrolyze  irreversible hydrolysis  anionic  cationic

potassium sulfate

- does not hydrolyze  irreversible hydrolysis  anionic  cationic

sodium carbonate

- does not hydrolyze  irreversible hydrolysis  anionic  cationic

aluminium sulfide

- does not hydrolyze  irreversible hydrolysis  anionic  cationic

Save

**Question # 20. Chemical equilibrium.**

Match the following influences on the equilibrated system  $\text{CH}_3\text{-CH}_2\text{-CH}_2\text{-CH}_3 \sim_{\text{(gas)}} \rightleftharpoons \text{CH}_2\text{=CH-CH=CH}_2 \sim_{\text{(gas)}} + 2\text{H}_2 \sim_{\text{(gas)}} - Q$  with the equilibrium shifts they result

**increase of pressure**

- towards the side of the reactants  practically does not shift  towards the side of the products

**addition of a catalyst**

- towards the side of the reactants  practically does not shift  towards the side of the products

**decrease of hydrogen concentration**

- towards the side of the reactants  practically does not shift  towards the side of the products

**decrease of pressure**

- towards the side of the reactants  practically does not shift  towards the side of the products

Save

**Question # 21. Qualitative reactions of organic compounds.**

Match the following pairs of compounds with the substances they can be distinguished by.

aniline and triethylamine

- $\text{Na}_2\text{CO}_3$    $\text{NaOH}$    $\text{H}_2$    $\text{Br}_2 \sim_{\text{(aqua)}}$    $\text{Br}_2 \sim_{\text{(aqua)}}$

- $[\text{Ag}(\text{NH}_3)_2]\text{OH}$    $[\text{Ag}(\text{NH}_3)_2]\text{OH}$

Formic acid and acetic acid

- $\text{Na}_2\text{CO}_3$    $\text{Na}_2\text{CO}_3$    $\text{NaOH}$    $\text{NaOH}$    $\text{H}_2$    $\text{H}_2$    $\text{Br}_2$    $\sim_{\{(aqua)\}} \text{Br}_2 (aqua)$
- $[\text{Ag}(\text{NH}_3)_2]\text{OH}$    $[\text{Ag}(\text{NH}_3)_2]\text{OH}$

propyne and 1,3-butadiene

- $\text{Na}_2\text{CO}_3$    $\text{Na}_2\text{CO}_3$    $\text{NaOH}$    $\text{NaOH}$    $\text{H}_2$    $\text{H}_2$    $\text{Br}_2$    $\sim_{\{(aqua)\}} \text{Br}_2 (aqua)$
- $[\text{Ag}(\text{NH}_3)_2]\text{OH}$    $[\text{Ag}(\text{NH}_3)_2]\text{OH}$

phenol and ethanediol

- $\text{Na}_2\text{CO}_3$    $\text{Na}_2\text{CO}_3$    $\text{NaOH}$    $\text{NaOH}$    $\text{H}_2$    $\text{H}_2$    $\text{Br}_2$    $\sim_{\{(aqua)\}} \text{Br}_2 (aqua)$
- $[\text{Ag}(\text{NH}_3)_2]\text{OH}$    $[\text{Ag}(\text{NH}_3)_2]\text{OH}$

Save

Question # 22. Qualitative reactions of inorganic compounds.

Match the following pairs of compounds with the reagent they can be distinguished by.

$\text{CaCl}_2$  and  $\text{KCl}$

- lead nitrate  lithium nitrate  potassium carbonate  barium nitrate  phenolphthalein
- $\text{Na}_2\text{SO}_3$  and  $\text{Na}_2\text{SO}_4$

- lead nitrate  lithium nitrate  potassium carbonate  barium nitrate

phenolphthalein  $\text{Na}_2\text{SO}_4$  and  $\text{ZnSO}_4$

- lead nitrate  lithium nitrate  potassium carbonate  barium nitrate  phenolphthalein
- $\text{FeCl}_2$  and  $\text{Zn}(\text{NO}_3)_2$

- lead nitrate  lithium nitrate  potassium carbonate  barium nitrate  phenolphthalein

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Question # 23. Media of water solutions of salts.

Match the following salts with the correct type of the medium of their water solutions.

potassium carbonate

- alkaline  neutral  acidic

barium nitrate

- alkaline  neutral  acidic

sodium sulfate

- alkaline  neutral  acidic  iron chloride(III)  alkaline  neutral  acidic

Save

Question # 24. Characteristic properties of different classes of organic compounds

Match the following reagents with the products of their reactions with excess of hydrogen.

propene

- isobutene  dimethylpropane  isoprene  methylbutane  propane  butane
- cyclopropane

- isobutane  dimethylpropane  isoprene  methylbutane  propane  butane
- propene

- isobutane  dimethylpropane  isoprene  methylbutane  propane  butane
- methylpropene

- isobutane  dimethylpropane  isoprene  methylbutane  propane  butane

Save

Question # 26. Properties of hydrocarbons and oxygen containing compounds.

Match the following reagent with the organic products of their reactions.

acetic acid and sodium carbonate

- copper acetate(II)  sodium acetate  sodium formate  copper formate(II)  carbon dioxide  
 sodium ethoxide

formic acid and sodium hydroxide

- copper acetate(II)  sodium acetate  sodium formate  copper formate(II)  carbon dioxide  
 sodium ethoxide

formic acid and copper oxide(II) (heat)

- copper acetate(II)  sodium acetate  sodium formate  copper formate(II)  carbon dioxide  
 sodium ethoxide

ethanol and sodium

- copper acetate(II)  sodium acetate  sodium formate  copper formate(II)  carbon dioxide  
 sodium ethoxide

### Question # 27. Calculations for redox reactions

Calculate the sum of the coefficients in the equation of the oxidation-reduction reaction occurred by the addition of potassium iodide to a solution of potassium dichromate acidified by sulfuric acid.

Enter your answer

### Question # 28. Ion-exchange reactions.

An ion-exchange reaction occurred by mixing of an excess of potassium hydroxide solution and ammonium hydrocarbonate solution. Calculate the sums of the coefficients of the molecular, complete and net equations of the reaction. (Write the numbers in the given order. Separate them by comma.)

Enter your answer

### Question # 29. Gas volume calculation.

For the total combustion of carbon is needed 78 L of oxygen (STP). Calculate the volume (in litres) of carbon dioxide that is theoretically produced. (Write the number accurate to the whole.)

Enter your answer

### Question # 30. Mass fraction calculation.

Calculate the mass of water (in grams) that is needed to be evaporated from 150 g of a 10% solution of a salt to get a 30% solution of this salt. (Write the number accurate to the whole.)

Enter your answer

Question # 31. Calculation of the mass or volume by the parameters of one of the reactants.

14.5 g of zinc was dissolved in an excess of sodium hydroxide water solution. Calculate the volume of gas (in litres) released from the reaction (STP). (Write the number accurate to the whole.)

Enter your answer

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**Question # 32. Interrelation of different classes of inorganic substances and reactions description.**

A liquid foul-smelling substance (A) was produced by the reaction between hydrogen bromide and potassium permanganate. This substance (A) was then separate and heated with iron turnings. A product of the reaction (B) was then dissolved in water, and a solution of cesium hydroxide was added. A formed precipitate (C) was filtered and calcinated, and a solid substance (D) was produced. Of the following substances, decide which substances are A, B, C and D

The substance A is

Fe(OH)<sub>3</sub>  Fe(OH)<sub>3</sub>  MnBr<sub>2</sub>  MnBr<sub>2</sub>  Fe<sub>2</sub>O<sub>3</sub>  Fe<sub>2</sub>O<sub>3</sub>  H<sub>2</sub>O  H<sub>2</sub>O

FeBr<sub>3</sub>  FeBr<sub>3</sub>  Br<sub>2</sub>  Br<sub>2</sub>

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