DEMOVERSION OF COMPUTER TESTING USING REMOTE TECHNOLOGIES

For tasks 1-3, use the following row of chemical elements.				
1)Be	2)H	3)F	4)Li	5)Si

1. Determine from the elements indicated above which atoms have one electron missing for completion of electronic shell.

Answer:

2. Select three elements that are in the Periodic Table are in the same period. Arrange the selected chemical elements in increasing order of their atomic radius.

Answer:

3. Select two compounds from indicated above between which a hydrogen bond occurs.

1) methane
2) silane
3) ethanol
4) phosphine
5) formic acid

Answer:

4. Establish a correspondence between the formula of the substance and the class / group to which this substance belongs.

FORMULA OF SUBSTANCE	CLASS or GROUP
A) $HMnO_4$	1) acidic oxide
B) $KHSiO_3$	2) non-salt-forming oxide
C) CO	3) acidic salt
	4) acid

Answer:

A	B	C

5. Two test tubes with a solution of chromium (III) chloride are given. A solution of a weak electrolyte X was added to one of them, and a solution of a strong electrolyte Y was added to the other. As a result, the formation of a precipitate was observed in each of the test tubes. From the proposed list, select substances X and Y that can enter into the described reactions.

1) hydrogen bromide
2) ammonia
3) hydrogen iodide
4) calcium bromide
5) silver nitrate

Answer:

6. Establish a correspondence between the reagents and the product(s) of their interaction.

REAGENTS	PRODUCT(S)
A) $CaO + SO_2 \rightarrow$	1) $CaSO_4$
B) $CaO + SO_3 \rightarrow$	2) $CaSO_4 + H_2$
C) $CaO + H_2SO_3 \rightarrow$	3) $CaSO_4 + H_2O$
D) $CaO + H_2SO_4 \rightarrow$	4) $CaSO_3$
	5) $CaSO_3 + H_2$
	6) $CaSO_3 + H_2O$

Answer:

A	B	C	D

7. The following scheme for the transformation of substances is given

$SO_3 \xrightarrow{X} H_2SO_4 \xrightarrow{Y} H_2S$

Determine which of these substances are substances X and Y.

1) H_2
2) H_2O_2
3) H_2O
4) $ZnSO_4$
5) K_2SO_4

Answer:

X	Y

8. Establish a correspondence between the name of the substance and the class / group to which this substance belongs.

NAME OF SUBSTANCE	CLASS or GROUP
A) methyl benzoate	1) alcohol
B) ethylene glycol	2) amino acid
C) alanine	3) ester
	4) nitro compound

Answer:

A	B	C

9. Select two substances that are homologues

1) benzene
2) styrene
3) toluene
4) glycerol
5) glycine

Answer:

10. Choose two substances that decolorize bromine water

1) propane
2) ethylene
3) divinyl
4) cyclopentane
5) isobutane

Answer:

11. From the proposed list, select two substances with which ethanol reacts

1) potassium
2) aluminum hydroxide
3) nitrogen
4) potassium bicarbonate
5) formic acid

Answer:

12. The following scheme for the transformation of substances is given

Acetylene $\xrightarrow{X}$ ethanal $\xrightarrow{Y}$ ethanol

Determine which of these substances are substances X and Y.

1) H_2 (cat)
2)H_2O_2
3)$H_2O(Hg^{2+})$
4)$KMnO_4(H^+)$
5) O_2 (cat)

Answer:

X	Y

13. Establish a correspondence between the formula of salt and the products of electrolysis of its aqueous solution, which were released on inert electrodes

SUBSTANCE FORMULA	ELECTROLYSIS PRODUCTS
A) $Al(NO_3)_3$	1) metal and oxygen
B) $Hg(NO_3)_2$	2) hydrogen and oxygen
C) KCl	3) hydrogen and halogen
D) $CsNO_3$	4) metal and halogen
	5) metal and nitric oxide (IV)

Answer:

A	B	C	D

14. For listed substances, determine the nature of the environment of their aqueous solutions having the same concentration (mol / l).

1) K_2SO_4

2) $ZnCl_2$

3) Na_2S

4) $HClO_4$

Write down the numbers of substances in ascending order of the pH value of their aqueous solutions.

Answer:_____

15. Establish a correspondence between the external influence on the system and a shift in chemical equilibrium in the system.

REACTION EQUATION	CHANGE OF EXTERNAL CONDITIONS
A) $N_{2(g)} + 3H_{2(g)} \leftrightarrow 2NH_{3(g)} + Q$	1) increase in temperature and hydrogen concentration

Б) $H_2O_{(g)} + CH_4 \leftrightarrow 3H_{2(g)} + CO_{(g)} - Q$

В) $H_{2(g)} + I_{2(тв)} \leftrightarrow 2HI_{(g)} - Q$

Г) $C_2H_{6(g)} \leftrightarrow C_2H_{4(g)} + H_{2(g)} - Q$

2) decrease in temperature and hydrogen concentration

3) increase in temperature and decrease in hydrogen concentration

4) decrease in temperature and increase in hydrogen concentration

Answer:

A	B	C	D

16. 5 ml of water and 10 g of sodium nitrate were added to 200 g of a solution with a mass fraction of sodium nitrate of 12%. What is the mass fraction of salt in the resulting solution?

Answer:_____ _____% (Write down the number to the nearest tenth.)

17. In accordance with the thermochemical equation

$CH_{4(g)} + 2O_{2(g)} = CO_{2(g)} + 2H_2O_{(g)} + 880$ kJ

during the combustion of 56 l of methane (normal conditions), heat is released in the amount_____ kJ

Answer:____ _____ kJ (Write down the integer number)

18. Select substances (potassium hypochlorite, potassium hydroxide, iron (III) sulfate, chromium (III) oxide, magnesium oxide, sodium iodide) between which a redox reaction is possible in an alkaline environment

Specify the oxidizing agent _____

Specify a reducing agent _____

What is the oxidation product in this reaction? _____

How many electrons does the oxidizing agent take in a given reaction _____

19. For electrolysis (on inert electrodes), 390 g of a 15% sodium chloride solution were taken. After the mass of the solution decreased by 21.9 g, the process was stopped. To the resulting solution was added 160 g of a 20% solution of copper (II) sulfate.

Indicate in the answer:

As a result of the electrolysis reaction, what substances are formed (formulas) on the cathode_____; at the anode_____

The number of moles of formed substances, respectively

Answer:___ Write down the number to the nearest tenth.)

The mass of the resulting solution

Answer:_____ g (Write down the integer number)

Mass fraction of sodium chloride in the resulting solution

Answer:_____ _____% (Write down the number to the nearest hundredth)

20. When burning 2.55 g of organic matter, 3.36 liters of carbon dioxide (normal conditions) and 3.15 g of water were obtained. It is known that this compound does not enter into an esterification reaction and does not interact with metallic sodium. It can be obtained in one step from isopropanol

Indicate in the answer:

A) The molar ratio of C: H: O in compound

B) Name the compound

C) Specify the type of reaction by which this compound can be obtained.