General chemistry
(დასკვნითი გამოცდის ნიმუში)

Question 1

What is oxidation state of phosphorus in P_2O_5?

Select one:

○ a. -2

○ b. +2

○ c. -5

○ d. +5

Question 2

What is oxidation state of sulfur in Na_2SO_4?

Select one:

○ a. +6

○ b. +5

○ c. +4

○ d. -2

Question 3

What is oxidation state of oxygen in Na_2O_2?

Select one:

○ a. -1

○ b. +5

○ c. -2

○ d. +4

Question 4

What is oxidation state of Nitrogen in $(NO_3)-$?

Select one:

○ a. +4

○ b. +6

○ c. -2

○ d. +5

Question 5

Of the following, which will most likely be an oxidizing agent: Ca, Ag^+, K ?

Select one:

a. K

b. Ag^+

c. Ca

d. Al

Question 6

Of the following, which will most likely oxidized: F_2, Cu^{2+}, Na ?

Select one:

a. Ca

b. Na

c. Cu^{2+}

d. Cl_2

Question 7

For the following example identify oxidizing agent: $4Al + 3O_2 \rightarrow 2Al_2O_3$

Select one:

a. both

b. O_2

c. Al^{+3}

d. neither

Question 8

For the following example identify oxidizing agent: $4P + 5O_2 \rightarrow 2P_2O_5$

Select one:

a. both

b. Al^{+3}

c. O_2

d. neither

Question 9

Which of the following transformations is a redox reaction?

Select one:

a. $4P + 5O_2 \rightarrow 2P_2O_5$

b. $Cu(OH)_2 \rightarrow CuO + H_2O$

c. $AlCl_3 + 3NaOH \rightarrow Al(OH)_3 + 3NaCl$

d. $NaOH + HCl \rightarrow NaCl + H_2O$

Question 10

Express rate law for reaction: $S(s) + O_{2(g)} \rightarrow S_{O2}$

Select one:

a. $V= k[SO_2]$

b. $V = k [S]$

c. $V = k [O_2]$

d. $V = k [S] [O_2]$

Question 11

A solution consists of two parts. What is the name of the part, that is dissolved?

Select one:

a. solvent

b. solute

c. solution

Question 12

Area of compound   NaCl in water solution is?

Select one:

a. basic

b. acidic

c. neutral

Question 13

What does it mean, when a solution is supersaturated?

Select one:

a. not enough solute

b. too much solute

c. just enough solute

Question 14

Area of compound $AlCl_3$ in water solution is?

Select one:

a. acidic

b. basic

c. neutral

Question 15

What is the rate law for the reaction: $A + B + C \rightarrow D$

Select one:

○ a. $V=K[A][B]^2$

○ b. $V=K[A][B][C]$

○ c. $V=K[A]^2[B]$

○ d. $V=K[A][B]$

Question 16

What is the rate law for the reaction: $A(g) + 2B(g) \rightarrow D$

Select one:

○ a. $V=K[A][B]^2$

○ b. $V=K[A][B]$

○ c. $V=K[A][B][C]$

○ d. $V=K[A]^2[B]$

Question 17

Classify the following reaction: $Fe + CuSO_4 \rightarrow FeSO_4 + Cu$

Select one:

○ a. synthesis

○ b. Decomposition

○ c. redox

○ d. precipitation

Question 18

Express Equilibrium Constant for reaction: $N_2(g) + 3H_2(g) \rightleftarrows 2NH_3(g)$;

Select one:

○ a. $Kc = [NH_3]^2/[N_2]\times[H_2]$

○ b. $Kc = [NH_3]^2/[N_2]\times[H_2]^2$

○ c. $Kc = [NH_3]/[N_2]\times[H_2]_2$

○ d. $Kc = [NH_3]/[N_2]\times[H_2]$

Question 19
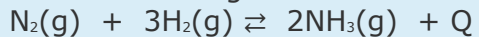
Express Equilibrium Constant for reaction: $2NO(g) + O_2(g) \rightleftarrows 2NO_2(g)$;

Select one:

○ a. $Kc = [NO_2]/[NO]^2\times[O_2]^2$

○ b. $Kc = [NO_2]^2/[O_2]^2$

○ c. $Kc = [NO_2]^2/[NO]^2\times[O_2]$

○ d. $Kc = [NO_2]^2/[NO]^2\times[O_2]^2$

Question 20

Consider the following exothermic reaction:

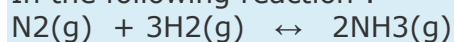$$N_2(g) + 3H_2(g) \rightleftarrows 2NH_3(g) + Q$$

If the temperature of a gas mixture is increased, in which direction the equilibrium will shift?

Select one:

○ a. From left to right

○ b. No change

○ c. From right to left

Question 21

In the following reaction :

$$N2(g) + 3H2(g) \leftrightarrow 2NH3(g)$$

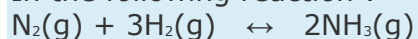what would be effect of doubling the concentration of N2?

Select one:

○ a. The rate of reaction does not change

○ b. The rate of reaction drops by half

○ c. The rate of reaction double

○ d. The rate of reaction quadruples

Question 22

In the following reaction :

$$N_2(g) + 3H_2(g) \leftrightarrow 2NH_3(g)$$

what would be effect of doubling the concentration of H_2?

Select one:

○ a. The rate of reaction quadruples

○ b. The rate of reaction increases 9 time

○ c. The rate of reaction double

○ d. The rate of reaction does not change

Question 23

Balance the following reaction: $MnO_2 + HCl \rightarrow MnCl_2 + Cl_2 + H_2O$

When the following equation is balanced, what is the coefficient for the hydrochloric acid?

Select one:

○ a. 16

○ b. 4

○ c. 44

○ d. 32

Question 24

Consider reaction: $N_2(g) + 3H_2(g) \rightleftarrows 2 NH_3(g)$
If the pressure of a gas mixture is increased, in which direction the equilibrium will shift?

Select one:

○ a. No change

○ b. From left to right

○ c. From right to left

Question 25

Consider reaction: $CO(g) + H_2O(g) \rightleftarrows CO_2(g) + H_2(g)$;
If the pressure of a gas mixture is increased, in which direction the equilibrium will shift?

Select one:

○ a. From right to left

○ b. No change

○ c. From left to right

Question 26

Calculate the number of moles of H2SO4 in 50 cm3 of a 0.50 moldm-3 solution.

Select one:

○ a. 0.025

○ b. 0.993

○ c. 0,883

○ d. 0.012

Question 27

Find the masses of sodium chloride and water required to obtain 175 g of a 10 % solution

Select one:

○ a. 88.3

○ b. 17.5

○ c. 25.5

○ d. 88.3

Question 28

Find the mass percentage of 6 g sodium hydroxide dissolved in 54 g of water.

Select one:

○ a. 6%

○ b. 10%

○ c. 14%

○ d. 20%