

**General chemistry**  
**I Semester. 2020-2021 Years**  
(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<sup>+</sup>
- c. Ca
- d. Al

#### Question 6

Of the following, which will most likely oxidized: F<sub>2</sub>, Cu<sup>2+</sup>, Na ?

Select one:

- a. Ca
- b. Na
- c. Cu<sup>2+</sup>
- d. Cl<sub>2</sub>

#### Question 7

For the following example identify oxidizing agent:  $4\text{Al} + 3\text{O}_2 \rightarrow 2\text{Al}_2\text{O}_3$

Select one:

- a. both
- b. O<sub>2</sub>
- c. Al<sup>+3</sup>
- d. neither

#### Question 8

For the following example identify oxidizing agent:  $4\text{P} + 5\text{O}_2 \rightarrow 2\text{P}_2\text{O}_5$

Select one:

- a. both
- b. Al<sup>+3</sup>
- c. O<sub>2</sub>
- d. neither

#### Question 9

Which of the following transformations is a redox reaction?

Select one:

- a.  $4\text{P} + 5\text{O}_2 \rightarrow 2\text{P}_2\text{O}_5$
- b.  $\text{Cu}(\text{OH})_2 \rightarrow \text{CuO} + \text{H}_2\text{O}$
- c.  $\text{AlCl}_3 + 3\text{NaOH} \rightarrow \text{Al}(\text{OH})_3 + 3\text{NaCl}$
- d.  $\text{NaOH} + \text{HCl} \rightarrow \text{NaCl} + \text{H}_2\text{O}$

**Question 10**

Express rate law for reaction:  $S(s) + O_{2(g)} \rightarrow S_{O_2}$

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:  $N_2(g) + 3H_2(g) \rightleftharpoons 2NH_3(g)$ ;

Select one:

- a.  $K_c = [NH_3]^2/[N_2]x[H_2]$
- b.  $K_c = [NH_3]^2/[N_2]x[H_2]^2$
- c.  $K_c = [NH_3] / [N_2]x[H_2]_2$
- d.  $K_c = [NH_3] / [N_2]x[H_2]$

#### Question 19

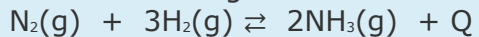
Express Equilibrium Constant for reaction:  $2NO(g) + O_2(g) \rightleftharpoons 2NO_2(g)$ ;

Select one:

- a.  $K_c = [NO_2]/[NO]^2x[O_2]^2$
- b.  $K_c = [NO_2]^2/[O_2]^2$
- c.  $K_c = [NO_2]^2/[NO]^2x[O_2]$
- d.  $K_c = [NO_2]^2/[NO]^2x[O_2]^2$

### Question 20

Consider the following exothermic reaction:



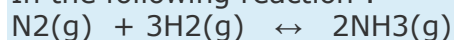
If the temperature of a gas mixture is increased, in which direction the equilibrium will shift?

Select one:

- a. From left to right
- b. No change
- c. From right to left

### Question 21

In the following reaction :



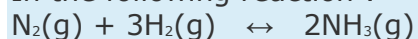
what would be effect of doubling the concentration of  $\text{N}_2$ ?

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 :



what would be effect of doubling the concentration of  $\text{H}_2$ ?

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:  $\text{MnO}_2 + \text{HCl} \rightarrow \text{MnCl}_2 + \text{Cl}_2 + \text{H}_2\text{O}$

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:  $\text{N}_2(\text{g}) + 3\text{H}_2(\text{g}) \rightleftharpoons 2\text{NH}_3(\text{g})$

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:  $\text{CO}(\text{g}) + \text{H}_2\text{O}(\text{g}) \rightleftharpoons \text{CO}_2(\text{g}) + \text{H}_2(\text{g})$ ;

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  $\text{H}_2\text{SO}_4$  in 50 cm<sup>3</sup> of a 0.50 mol dm<sup>-3</sup> 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%