Select a single answer. For each correct answer you get 2 points. Usage of pencil, selecting more than 1 answer and crossing over the answer is not allowed and will not be evaluated.

MULTIPLE CHOICE QUESTIONS TEST WITH ONE CORRECT ANSWER
(Select just one answer A, B, C or D)

1. Which of the following equations represents condensation reaction?
A. $CaO + CO_2 = CaCO_3$
B. $2H_2CrO_4 = H_2Cr_2O_7 + H_2O$
C. $C_2H_4 + Cl_2 = C_2H_4Cl_2$
D. $Mg + 2HCl = MgCl_2 + H_2$

2. Which of the following processes is exothermic?
A. Ice melting.
B. Ethanol evaporation.
C. Steam condensation.
D. Naphtalene sublimation.

3. Which of the following equations holds for enthalpy?
A. $H = q \cdot \xi$
B. $H = U \cdot \xi$
C. $H = U - PV$
D. $H = U + PV$

4. A substance for which the dissolution process is strongly endothermic dissolves in water in a glass cup. What temperature change can be felt if the glass wall is touched, before and during the dissolution?
A. Increase of temperature.
B. Decrease of temperature.
C. No temperature change takes place.
D. There is no temperature exchange between the solution and glass wall.

5. At the end of an irreversible reactions:
A. the reaction extent obtains the minimal possible value.
B. in the reaction system, at least one of the reactants is absent.
C. there are no reaction products in the reaction system.
D. in the reaction system, there are measurable quantities of all participants in the reaction.

6. Given the fallowing thermochemical equation:

$\frac{1}{2} H_2(g) + \frac{1}{2} I_2(g) = HI(g) \quad \Delta_r H = 26{,}5$ kJ/mol

What is going to be the value of the reaction enthalpy, if the stoichiometric part of the thermochemical equation is written like this?

$$H_2(g) + I_2(g) = 2HI(g)$$

A. $\Delta_r H = -26{,}5$ kJ/mol
B. $\Delta_r H = 13{,}25$ kJ/mol
C. $\Delta_r H = -13{,}25$ kJ/mol
D. $\Delta_r H = 53{,}00$ kJ/mol

7. The rate of chemical reaction is expressed by the unit
A. mol/s.
B. mol·s.
C. mol·dm^3·s.
D. mol·s/dm^3.

8. The temperature coefficient for a certain chemical reaction is 3. What is the change of the reaction rate, if the temperature of the reaction system increases for 10 K?
A. It increases for 3.
B. It increases for 30.
C. It increases 3 times.
D. It increases 30 times.

9. The activation energy is:
A. the difference between the energy of the activated complex and that of the reactants.
B. the difference between the energy of the products and that of the reactants.
C. the energy of the activated complex.
D. the energy of transition state.

10. Which of the following statements about the catalyst is NOT correct?
A. The catalyst participates in activated complex formation.
B. The catalyst decreases the activation energy.
C. In no case, can the catalyst change the reaction pathway.
D. The catalyst cannot induce the impossible reaction to take place.

11. The reaction proceeds spontaneously if:
A. $\Delta_r G = 0$
B. $\Delta_r G > 0$
C. $\Delta_r H > 0$
D. $\Delta_r G < 0$

12. The chemical equilibrium of the reaction given by the following equation

$$PCl_3(g) + Cl_2(g) \rightleftharpoons PCl_5(g)$$

is shifted towards formation of the reactants if:
A. the concentration of PCl_5 decreases.
B. the concentration of PCl_3 increses.
C. the concentration of PCl_5 increses.
D. a catalyst is added in the reaction system.

13. Which of the following statements about the chemical equilibrium constant (K_c) is correct?
A. For the very same reaction, K_c has different values at different temperatures.
B. In the chemical equilibrium expression the initial concentrations of the reaction participants are written.
C. For each reaction K_c is unitless quantity.
D. The low value of K_c indicates that the amount of products exceeds the amount of reactants.

14. Which of the following equations represents an ionic reaction that does not effectively proceed?
A. $NH_4Cl(aq) + NaOH(aq) = NaCl(aq) + H_2O(l) + NH_3(g)$
B. $2AsCl_3(aq) + 3H_2S(aq) = As_2S_3(s) + 6HCl(aq)$
C. $H_2SO_4(aq) + 2NaOH(aq) = Na_2SO_4(aq) + 2H_2O(l)$
D. $KCl(aq) + NaNO_3(aq) = KNO_3(aq) + NaCl(aq)$

15. What is the correct expression for the chemical equilibrium constant of the equilibrium process presented by the following equation:

$$Ag_2CrO_4(s) \rightleftharpoons 2Ag^+(aq) + CrO_4^{2-}(aq)$$

A. $K_c = c(Ag^+)^2 \cdot c(CrO_4^{2-}) / c(Ag_2CrO_4)$
B. $K_c = c(Ag^+)^2 \cdot c(CrO_4^{2-})$
B. $K_c = c(Ag^+)^2 + c(CrO_4^{2-})$
D. $K_c = [c(Ag^+)^2 + c(CrO_4^{2-})] / c(Ag_2CrO_4)$

16. What is going to happen if an unsaturated solution of Na_2SO_4 is added to a saturated solution of Ag_2SO_4?
A. Nothing is going to happen.
B. The solution of Ag_2SO_4 becomes unsaturated.
C. Ag_2SO_4 precipitates.
D. Na_2SO_4 precipitates.

17. Which of the following equations represents a protolytic reaction?
A. $NO(g) + \frac{1}{2} O_2(g) \rightleftharpoons NO_2(g)$
B. $CaO(s) + CO_2(g) \rightleftharpoons CaCO_3(s)$
C. $2K(s) + 2H_2O(l) = 2KOH(aq) + H_2(g)$
D. $HNO_2(aq) + NH_3(aq) \rightleftharpoons NH_4^+(aq) + NO_2^-(aq)$

18. The conjugate base of H_2SO_4 is:
A. HSO_4^-
B. OH^-
C. S^{2-}
D. H_3O^+

19. If an acid is a strong protolyte, its conjugate protolyte is:
A. weak conjugate acid.
B. weak conjugate base.
C. strong conjugate base.
D. strong conjugate acid.

20. What is the concentration of OH^- ions, at 25 °C, if $c(H_3O^+) = 1 \cdot 10^{-5}$ mol/L?
A. $c(OH^-) = 1 \cdot 10^{-5}$ mol/L
B. $c(OH^-) = 1 \cdot 10^{-7}$ mol/L.
C. $c(OH^-) = 1 \cdot 10^{-9}$ mol/L
D. $c(OH^-) = 1 \cdot 10^{-10}$ mol/L

21. In acidic solutions at 25 °C:
A. $c(H_3O^+) < 1 \cdot 10^{-7}$ mol/L.
B. pH < 7.
C. pH > 7.
D. $c(H_3O^+) = 1 \cdot 10^{-7}$ mol/L.

22. What is the pH of KOH solution with $c(KOH) = 10^{-3}$ mol/dm^3, at 25 °C?
A. 10^{-11}
B. 3
C. 11
D. 10^{-14}

23. Which of the following salts does not undergo hydrolysis?
A. Cs_2SO_4
B. K_2S
C. NH_4NO_3
D. $NaCH_3COO$

24. Which of the following salts undergo hydrolysis?
I. NaCN II. KNO_3 III. $CaCl_2$
IV. $Ca(CH_3COO)_2$
A. All of them.
B. Only IV.
C. Only I and IV.
D. None of them all.

25. At 25 °C, the pH of an aquous solution of NH_4Cl is:
A. pH < 7
B. pH = 7
C. pH > 7
D. pH = 0

КЛУЧ ЗА ОПШТИНСКИ НАТПРЕВАР ПО ХЕМИЈА ЗА СРЕДНО ОБРАЗОВАНИЕ 2020

II КАТЕГОРИЈА-ENG

1	**B**
2	**C**
3	**D**
4	**B**
5	**B**
6	**D**
7	**A**
8	**C**
9	**A**
10	**C**
11	**D**
12	**C**
13	**A**
14	**D**
15	**B**
16	**C**
17	**D**
18	**A**
19	**B**
20	**C**
21	**B**
22	**C**
23	**A**
24	**C**
25	**A**