

PM SHRI KENDRIYA VIDYALAYA SITAPUR (FIRST SHIFT)
UNIT TEST II (2024-25)
SUB-CHEMISTRY
CLASS-XI

Max. Marks=40

Time-90 Minutes

Instructions:

- (i) All questions are compulsory.
(ii) Question 1 to question 10 are objective/ competency based. Each carry 1 mark each.

Q.1. Which of the following is the correct IUPAC name for $\text{CH}_3\text{-CH}_2\text{-CH}_2\text{-CHO}$?

- a) Propanal
- b) Butanal
- c) Ethanal
- d) Butan-2-al

Q. 2. Oxidation number of P in PO_4^{3-} , of S in SO_4^{2-} and that of Cr in $\text{Cr}_2\text{O}_7^{2-}$ are respectively:

- (a) +3, +6 and +5
- (b) +5, +3 and +6
- (c) +3, +6 and +6
- (d) +5, +6 and +6

Q.3. Which of the following is not a redox reaction?

- (a) $\text{CaCO}_3 \rightarrow \text{CaO} + \text{CO}_2$
- (b) $\text{O}_2 + 2\text{H}_2 \rightarrow 2\text{H}_2\text{O}$
- (c) $\text{Na} + \text{H}_2\text{O} \rightarrow \text{NaOH} + 1/2\text{H}_2$
- (d) $\text{MnCl}_3 \rightarrow \text{MnCl}_2 + 1/2 \text{Cl}_2$

Q.4. The most powerful oxidising agent among the following is:

- (a) H_2SO_4
- (b) H_3BO_3
- (c) HPO_3
- (d) H_3PO_4

Q.5. Which of the following is the IUPAC name for the compound $\text{CH}_3\text{-CH}_2\text{-CH=CH}_2$?

- a) But-1-ene
- b) But-2-ene
- c) Prop-1-ene
- d) Eth-1-ene

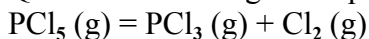
Q.6. What is the IUPAC name for the compound with the structure $\text{CH}_3\text{-CH}_2\text{-C(OH)=CH}_2$?

- a) But-3-en-2-ol
- b) But-2-en-1-ol
- c) But-2-en-3-ol
- d) But-1-en-2-ol

Q. 7. The equilibrium constant for the reaction $\text{N}_2(\text{g}) + \text{O}_2(\text{g}) \rightleftharpoons 2\text{NO}(\text{g})$ is 4×10^{-4} at 2000 K. In presence of a catalyst, equilibrium is attained ten times faster. Therefore, the equilibrium constant, in presence of the catalyst, at 2000K K is :

- (a) 40×10^{-4}
- (b) 4×10^{-4}
- (c) 4×10^{-3}
- (d) Difficult to compute without more data

Q. 8. The following two equilibrium exist simultaneously in a closed vessel:



If some CO is added in to the vessel, then after the equilibrium is attained again, the concentration of

- a) PCl_5 will increase
- (b) PCl_5 will decrease
- c) PCl_5 will remain unaffected
- d) Cl_2 will increase

Q. 9. What is the correct IUPAC name of $\text{CH}_3\text{-CH}_2\text{-COOH}$?

- a) Acetic acid
- (b) Ethanoic acid
- c) Propanoic acid
- d) Butanoic acid

Q. 10. Which of the following is the correct IUPAC name for $\text{CH}_3\text{-CH=CH}_2$?

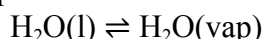
- a) Propene

- b) Prop-1-ene
- c) But-1-ene
- d) Ethene

Q. 11. Case Study – 1.

4 marks

When a liquid evaporates in a closed container, molecules with relatively higher kinetic energy escape the liquid surface into the vapour phase and number of liquid molecules from the vapour phase strike the liquid surface and are retained in the liquid phase. It gives rise to a constant vapour pressure because of an equilibrium in which the number of molecules leaving the liquid equals the number returning to liquid from the vapour. We say that the system has reached equilibrium state at this stage. However, this is not static equilibrium and there is a lot of activity at the boundary between the liquid and the vapour. Thus, at equilibrium, the rate of evaporation is equal to the rate of condensation. It may be represented by



The double half arrows indicate that the processes in both the directions are going on simultaneously. The mixture of reactants and products in the equilibrium state is called an equilibrium mixture.

i) When there is no change in the concentrations of either of the reactants or products, this stage of the system is the ...

- a) static equilibrium b) dynamic equilibrium c) physical equilibrium d) chemical equilibrium

ii) A ... solution means no more of solute can be dissolved in it at a given temperature.

- a) unsaturated
- b) supersaturated
- c) saturated
- d) None of these.

iii) The equilibrium involving ions in aqueous solutions which is called as ...

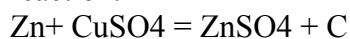
- a) static equilibrium b) dynamic equilibrium c) physical equilibrium d) ionic equilibrium

iv) The concentration of the solute in a saturated solution depends upon the ...

- a) solvent b) pressure c) temperature d) system

Q12. Case Study: 2.

Redox reactions involve the transfer of electrons between chemical species. For example, consider the reaction:



In this reaction, zinc displaces copper from copper sulfate, indicating a redox process. Here, zinc acts as the reducing agent, and copper acts as the oxidizing agent.

1. In the given reaction, which species is reduced?

- a) Zn
- b) Cu
- c) SO_4^{2-}
- d) Both Zn and Cu

2. What is the oxidation state of zinc in ?

- a) 0
- b) +1
- c) +2
- d) -2

3. Which of the following statements is true about the given reaction?

- a) Zinc gains electrons.
- b) Copper loses electrons.
- c) Zinc acts as a reducing agent.
- d) Sulfate ion participates in the redox reaction.

4. Which of the following represents the correct half-reactions for the above reaction?

- a) $\text{Zn} \rightarrow \text{Zn}^{2+} + 2\text{e}^-$ (Oxidation), $\text{Cu}^{2+} + 2\text{e}^- \rightarrow \text{Cu}$ (Reduction)
 b) $\text{Zn} \rightarrow \text{Zn}^{4+} + 4\text{e}^-$ (Oxidation), $\text{Cu}^{2+} + 2\text{e}^- \rightarrow \text{Cu}$ (Reduction)
 c) $\text{Zn}^{2+} + 2\text{e}^- \rightarrow \text{Zn}$ (Oxidation), $\text{Cu} \rightarrow \text{Cu}^{2+} + 2\text{e}^-$ (Reduction)
 d) $\text{Cu}^{2+} \rightarrow \text{Cu}^{4+} + 2\text{e}^-$ (Oxidation), $\text{Zn} \rightarrow \text{Zn}^{2+} + 2\text{e}^-$ (Reduction)

Q 13. Assertion and Reason Questions.

(2 mark)

Directions : In the following questions a statement of Assertion (A) followed by a statement of Reason (R) is given . Choose the correct option out of the choices given below .

- (a) Both A and R are true and R is correct explanation of A.
 (b) Both A and R are true and R is not correct explanation of A.
 (c) A is true but R is false.
 (d) Both A and R are false.

Q(i Assertion: Oxidation number of chlorine in is +1.

Reason: The sum of oxidation numbers of all atoms in a neutral compound is zero.

Q.(ii) Assertion: The equilibrium constant for a reaction is always equal to .

Reason: and are related by the expression .

Q.14. Calculate the oxidation number of the followings:

(i) $\text{K}_2\text{S}_2\text{O}_8$

(ii) oxidation no. of Cl in CaOCl_2

(2 mark)

Q.15. In the following reaction which one is oxidizing and reducing agent?

(2 mark)



Q.16 Write the nature of sodium oxalate and Lead carbonate ?

(2 mark)

Q .17 0.37 gm of $\text{Ca}(\text{OH})_2$ dissolved in water to give 500 ml of the solution. Calculate the pH value of solution? (3 marks)

Q .18 Write the structure of given compounds: (3 marks)

- 2-Methyl-5-oxohexanoic acid
- Benzene chloroketone
- 4-Oxopentanoic bromide

Q. 19. State Le-Chatelier's Principle Explain effect of concentration temperature and pressure with Example.

(4 marks)

Q.19. Balance the reaction by ion electron method:

(4 marks)

