CLASS – XI

PERIODIC TEST – 2

Subject: Chemistry
Time: 90 Minutes Max. Marks: 35

General Instructions:

1. This question paper contains 17 questions. All questions are compulsory.

2. The question paper is divided into five sections A, B, C, D and E.

3. Section A: Questions 1 to 8 are multiple choice questions. Each question carries 1 mark.

4. Section B: Questions 9 to 11 are very short answer type questions. Each question carries 2 marks.

5. Section C: Questions 12 to 15 are short answer type questions. Each question carries 3 marks.

6. Section D: Question 16 is a case-based question carrying 4 marks.

7. Section E: Question 17 is a long answer type question carrying 5 marks.

SECTION – A (1×8 = 8 Marks)

1. Solubility of AgCl in presence of NaCl solution
(A) Decreases due to common ion effect (B) Increases (C) Remains same (D) Increases due to common ion effect

2. The oxidation number of Cl in Cl_2O_7 is
(A) +5 (B) +7 (C) +3 (D) −7

3. The shape of carbocation is
(A) Planar (B) Linear (C) Pyramidal (D) Tetrahedral

4. The solubility product of $CaSO_4$ is 6.4×10^{-5}. The solubility of salt in mol L^{-1} is
(A) 8×10^{-16} (B) 8×10^{-2} (C) 8×10^{-3} (D) 16×10^{-3}

5. What type of redox reaction is $Cl_2 + 2OH^- \rightarrow ClO^- + Cl^- + H_2O$?
(A) Disproportionation (B) Combination (C) Decomposition (D) Double displacement

6. The IUPAC name of compound having formula $(CH_3)_3C–CH=CH_2$ is
(A) 3,3-dimethyl-1-propene (B) 1,1,1-trimethyl-3-propene (C) 3,3-dimethyl-1-butene (D) 1,1-dimethyl-3-butene

7. Assertion: Alkyl carbanions like ammonia have pyramidal shape.
Reason: The carbon atom carrying negative charge has an octet of electrons.

8. Assertion: A solution containing a mixture of acetic acid and sodium acetate maintains a constant pH.
Reason: A solution of acetic acid and sodium acetate acts as a buffer solution around 4.75.

SECTION – B (2×3 = 6 Marks)

9. Define the following:
(a) Buffer solution
(b) Common ion effect

10. Assign oxidation number to the underlined element in:
(a) $K_2Cr_2O_7$
(b) BaO_2
OR
Identify oxidising and reducing agents in the reaction:
$2MnO_4^- + 6I^- + 4H_2O \rightarrow 2MnO_2 + 3I_2 + 8OH^-$

11. In Carius method of estimation of halogen, 0.15 g of an organic compound gave 0.12 g of AgBr. Find the percentage of bromine.

SECTION – C (3×4 = 12 Marks)

12. Define solubility product. Write solubility product expression for $Zr_3(PO_4)_4$.
OR
What are acidic and basic buffers? Give one example of each.

13. Balance the following equation by ion-electron method (acidic medium):
$Cr_2O_7^{2-} + Fe^{2+} + H^+ \rightarrow Cr^{3+} + Fe^{3+} + H_2O$

14. (a) How many sigma and pi bonds are present in $CH{\equiv}C{-}CH{=}CHCH_3$?
(b) Write structural formula of 6-methyloctan-3-ol.
(c) Explain why $(CH_3)_3C^+$ is more stable than $CH_3CH_2^+$.
OR
Define Lassaigne's test.
Describe principles of distillation and chromatography.

15. (a) Define electrophile and nucleophile.
(b) Classify HS^-, BF_3, NO_2^+, $(CH_3)_3N$ as electrophiles or nucleophiles.

SECTION – D (4×1 = 4 Marks)

16. Read the passage carefully and answer the following questions based on solubility product and common ion effect.

SECTION – E (1×5 = 5 Marks)

17. (a) Define inductive effect, electromeric effect and resonance effect.
OR
(a) Name the type of isomerism exhibited by acetone and propanal.

(b) Write bond line formula for 2,3-dimethylbutanal.
(c) Distinguish between steam distillation and distillation.