

## JEE MAIN PRINCIPLES RELATED TO PRACTICAL CHEMISTRY — QUALITATIVE SALT ANALYSIS OF CATIONS — PYQS

**Max. Marks: 36**
**Questions: 9**

### Section A (MCQ) — 9 questions

- Q.1** Among  $\text{Fe}^{3+}$ ,  $\text{Pb}^{2+}$ ,  $\text{Cu}^{2+}$  and  $\text{Mn}^{2+}$ , identify the one that gets precipitated out while passing  $\text{H}_2\text{S}$  in presence of  $\text{NH}_4\text{OH}$  as group reagent. The highest possible oxidation state of the corresponding metal is [JEE Main 2026 (Online) 4th April Evening Shift]
- (1) +3      (2) +4      (3) +2      (4) +7

Scan or tap for the full solution



- Q.2** A salt with few drops of conc.  $\text{HCl}$  gives apple green colour in flame test. The group precipitate of the salt is dissolved in acetic acid and treated with  $\text{K}_2\text{CrO}_4$  to give yellow precipitate. When the sodium carbonate extract of the salt solution is heated with conc.  $\text{HNO}_3$  and ammonium molybdate, it resulted a canary yellow precipitate. The cation and anion present in the salt are respectively, [JEE Main 2026 (Online) 2nd April Morning Shift]

- (1)  $\text{Ca}^{2+}$  and  $\text{SO}_4^{2-}$       (2)  $\text{Ba}^{2+}$  and  $\text{PO}_4^{3-}$   
 (3)  $\text{Mn}^{2+}$  and  $\text{PO}_4^{3-}$       (4)  $\text{Ba}^{2+}$  and  $\text{SO}_4^{2-}$

Scan or tap for the full solution



- Q.3** Consider three metal chlorides x, y and z, where x is water soluble at room temperature, y is sparingly soluble in water at room temperature and z is soluble in hot water. x, y and z are respectively [JEE Main 2026 (Online) 24th January Morning Shift]

- (1)  $\text{AgCl}$ ,  $\text{Hg}_2\text{Cl}_2$  and  $\text{PbCl}_2$   
 (2)  $\text{CuCl}_2$ ,  $\text{AgCl}$  and  $\text{PbCl}_2$   
 (3)  $\text{AlCl}_3$ ,  $\text{PbCl}_2$  and  $\text{BaCl}_2$   
 (4)  $\text{MgCl}_2$ ,  $\text{AgCl}$  and  $\text{AlCl}_3$

Scan or tap for the full solution



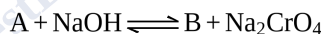
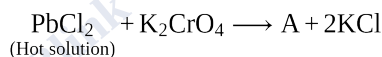
- Q.4** In the Group analysis of cations,  $\text{Ba}^{2+}$  &  $\text{Ca}^{2+}$  are precipitated respectively as [JEE Main 2026 (Online) 24th January Evening Shift]

- (1) sulphide & sulphide      (2) hydroxide & carbonate  
 (3) chromate & sulphide      (4) carbonate & carbonate

Scan or tap for the full solution



- Q.5** Consider the following reactions.



In the above reactions, A, B and X are respectively.

[JEE Main 2026 (Online) 21st January Morning Shift]

- (1)  $\text{Na}_2[\text{Pb}(\text{OH})_2]$ ,  $\text{PbCrO}_4$  and  $[\text{Pb}(\text{NH}_3)_4]\text{SO}_4$   
 (2)  $\text{Na}_2[\text{Pb}(\text{OH})_2]$ ,  $\text{PbCrO}_4$  and  $(\text{NH}_4)_2[\text{Pb}(\text{CH}_3\text{COO})_4]$   
 (3)  $\text{PbCrO}_4$ ,  $\text{Na}_2[\text{Pb}(\text{OH})_4]$  and  $(\text{NH}_4)_2[\text{Pb}(\text{CH}_3\text{COO})_4]$   
 (4)  $\text{PbCrO}_4$ ,  $\text{Na}_2[\text{Pb}(\text{OH})_4]$  and  $[\text{Pb}(\text{NH}_3)_4]\text{SO}_4$

Scan or tap for the full solution



- Q.6** When a salt is treated with sodium hydroxide solution it gives gas X. On passing gas X through reagent Y a brown coloured precipitate is formed. X and Y respectively, are [JEE Main 2025 (Online) 7th April Morning Shift]

- (1)  $\text{X} = \text{NH}_3$  and  $\text{Y} = \text{HgO}$   
 (2)  $\text{X} = \text{NH}_4\text{Cl}$  and  $\text{Y} = \text{KOH}$   
 (3)  $\text{X} = \text{NH}_3$  and  $\text{Y} = \text{K}_2\text{HgI}_4 + \text{KOH}$   
 (4)  $\text{X} = \text{HCl}$  and  $\text{Y} = \text{NH}_4\text{Cl}$

Scan or tap for the full solution



- Q.7** Choose the correct tests with respective observations. Choose the correct answer from the options given below :

- A.  $\text{CuSO}_4$  (acidified with acetic acid) +  $\text{K}_4[\text{Fe}(\text{CN})_6] \longrightarrow$  Chocolate brown precipitate.  
 B.  $\text{FeCl}_3 + \text{K}_4[\text{Fe}(\text{CN})_6] \longrightarrow$  Prussian blue precipitate.  
 C.  $\text{ZnCl}_2 + \text{K}_4[\text{Fe}(\text{CN})_6]$ , neutralised with  $\text{NH}_4\text{OH} \longrightarrow$  White or bluish white precipitate.  
 D.  $\text{MgCl}_2 + \text{K}_4[\text{Fe}(\text{CN})_6] \longrightarrow$  Blue precipitate.  
 E.  $\text{BaCl}_2 + \text{K}_4[\text{Fe}(\text{CN})_6]$ , neutralised with  $\text{NaOH} \longrightarrow$  White precipitate.

[JEE Main 2025 (Online) 2nd April Morning Shift]

- (1) A, D and E only      (2) A, B and C only  
 (3) B, D and E only      (4) C, D and E only

Scan or tap for the  
full solution



**Q.8** The metal ion whose electronic configuration is not affected by the nature of the ligand and which gives a violet colour in non-luminous flame under hot condition in borax bead test is

[JEE Main 2025 (Online) 28th January Morning Shift]

- (1)  $\text{Cr}^{3+}$       (2)  $\text{Ti}^{3+}$       (3)  $\text{Ni}^{2+}$       (4)  $\text{Mn}^{2+}$

Scan or tap for the  
full solution



**Q.9** Identify the inorganic sulphides that are yellow in colour :

- A.  $(\text{NH}_4)_2\text{S}$       B.  $\text{PbS}$   
 C.  $\text{CuS}$       D.  $\text{As}_2\text{S}_3$   
 E.  $\text{As}_2\text{S}_5$

Choose the **correct** answer from the options given below :

[JEE Main 2025 (Online) 28th January Evening Shift]

- (1) (D) and (E) only      (2) (A) and (B) only  
 (3) (A), (D) and (E) only      (4) (A) and (C) only

Scan or tap for the  
full solution



### ANSWER KEY

| Ques. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |  |  |
|-------|---|---|---|---|---|---|---|---|---|--|--|
| Ans.  | 4 | 2 | 2 | 4 | 3 | 3 | 2 | 3 | 1 |  |  |