



ARIHANTAM ACADEMY

Faith Strength Education

CLASS 12 CHEMISTRY — BIHAR BOARD (BSEB)

p-BLOCK ELEMENTS — DPP 34 TO 41

Student Workbook + Teacher Answer Key

Arihantam Academy • Faith Strength Education

Bihar Board Class 12 Chemistry: board-oriented daily practice for p-Block Elements. Includes Groups 15–18 and full revision.



ARIHANTAM ACADEMY

Faith Strength Education

CLASS 12 CHEMISTRY — BIHAR BOARD (BSEB)

DAILY PRACTICE PROBLEM — DPP 34

p-Block Elements | Group 15: nitrogen family and ammonia

Student Name: _____	Roll No.: _____
DPP No.: 34 Chapter: p-Block Elements	Date: _____
Topic: Group 15: nitrogen family and ammonia	Score: ____ / 30

Instructions: Answer all objective questions. Attempt any 3 short-answer questions and any 1 long-answer question.

Section A — Objective Questions (15 × 1 = 15)

- Group 15 configuration is:
(A) ns^2np^1 (B) ns^2np^2 (C) ns^2np^3 (D) ns^2np^4
- Nitrogen is anomalous due to:
(A) large size (B) small size and no d orbitals (C) metallic nature (D) low EN
- Common group 15 oxidation states are:
(A) +1,+2 (B) -3,+3,+5 (C) +2,+4,+6 (D) 0,+1
- N_2 has:
(A) single bond (B) double bond (C) triple bond (D) ionic bond
- N_2 is inert because of:
(A) low bond energy (B) high bond dissociation enthalpy (C) large size (D) metallic nature
- NH_3 shape is:
(A) linear (B) trigonal planar (C) trigonal pyramidal (D) tetrahedral
- NH_3 bond angle is about:
(A) 180° (B) 120° (C) 109.5° (D) 107°
- Commercial NH_3 preparation is:
(A) Contact (B) Haber (C) Ostwald (D) Hall
- Haber catalyst is:
(A) Ni (B) Fe (C) V_2O_5 (D) Pt-Rh
- NH_3 is a:
(A) strong acid (B) Lewis base (C) noble gas (D) oxidant only
- NH_3 with HCl gives:
(A) NH_4Cl (B) N_2H_4 (C) NO (D) HNO_3
- N_2O is:
(A) laughing gas (B) water gas (C) marsh gas (D) producer gas
- N oxidation number in NH_3 :
(A) +3 (B) -3 (C) +5 (D) 0
- N oxidation number in HNO_3 :
(A) -3 (B) +1 (C) +3 (D) +5
- Inert pair effect increases down group due to:
(A) ns^2 pair less available (B) size decreases (C) EN increases (D) d orbitals absent

Section B — Short Answer (Attempt any 3) (3 × 2 = 6)

- Write group 15 electronic configuration.
- Why is nitrogen anomalous?
- Why is N_2 inert?
- Give two reactions proving basic nature of NH_3 .
- State group 15 oxidation states.

Section C — Long Answer (Attempt any 1) (1 × 5 = 5)

- Explain preparation, properties and uses of NH_3 .
- Discuss anomalous behaviour of nitrogen.

Teacher record: MCQ ____/15 | Short ____/6 | Long ____/5 | Presentation/Homework ____/4 | Total ____/30



ARIHANTAM ACADEMY

Faith Strength Education

CLASS 12 CHEMISTRY — BIHAR BOARD (BSEB)

TEACHER ANSWER KEY — DPP 34

p-Block Elements | Group 15: nitrogen family and ammonia

MCQ answers: 1-C, 2-B, 3-B, 4-C, 5-B, 6-C, 7-D, 8-B, 9-B, 10-B, 11-A, 12-A, 13-B, 14-D, 15-A

Short-answer marking points

16. ns^2np^3 .

17. Small size, high EN/IE and no d orbitals.

18. High $N \equiv N$ bond dissociation enthalpy.

19. $NH_3 + HCl \rightarrow NH_4^+Cl^-$; $NH_3 + H_2O \rightleftharpoons NH_4^+ + OH^-$.

20. $-3, +3, +5$; lower states stabilised down group.

Long-answer marking points

21. Haber equation/conditions, properties, reactions and uses.

22. Small size, multiple bonding, no d orbitals, high EN/IE, $N \equiv N$ stability.

Remedial rule: Score below 15/26: revise reaction equations, structures and trends; take a 10-MCQ re-test.



ARIHANTAM ACADEMY

Faith Strength Education

CLASS 12 CHEMISTRY — BIHAR BOARD (BSEB)

DAILY PRACTICE PROBLEM — DPP 35

p-Block Elements | Phosphorus, oxyacids and chlorides

Student Name: _____	Roll No.: _____
DPP No.: 35 Chapter: p-Block Elements	Date: _____
Topic: Phosphorus, oxyacids and chlorides	Score: ____ / 30

Instructions: Answer all objective questions. Attempt any 3 short-answer questions and any 1 long-answer question.

Section A — Objective Questions (15 × 1 = 15)

- Phosphorus allotropes include:
(A) white red black (B) diamond graphite (C) alpha beta (D) one form only
- White P is stored under:
(A) alcohol (B) water (C) kerosene (D) air
- White P reactive due to:
(A) P-P strain (B) metal bonding (C) ionic nature (D) no bonds
- H_3PO_4 is:
(A) tribasic (B) dibasic (C) monobasic (D) tetrabasic
- H_2PO_4^- is:
(A) monobasic (B) dibasic (C) tribasic (D) tetrabasic
- HPO_4^{2-} is:
(A) monobasic (B) dibasic (C) tribasic (D) tetrabasic
- Basicity depends on number of:
(A) P-H bonds (B) ionisable O-H bonds (C) O atoms (D) P atoms
- H_3PO_4 is:
(A) oxidising (B) reducing (C) neutral (D) inert
- $\text{PCl}_5(\text{g})$ shape is:
(A) tetrahedral (B) trigonal bipyramidal (C) square planar (D) octahedral
- Solid PCl_5 exists as:
(A) PCl_5 only (B) $[\text{PCl}_4]^+[\text{Cl}]^-$ (C) PCl_5 only (D) PCl_4 only
- PCl_5 hydrolysis gives:
(A) $\text{H}_3\text{PO}_4 + \text{HCl}$ (B) $\text{NH}_3 + \text{HCl}$ (C) H_2SO_4 (D) PH_3
- PH_3 is:
(A) strong base (B) weakly basic poisonous gas (C) acidic oxide (D) metal
- P_2O_5 is:
(A) basic (B) acidic (C) neutral (D) amphoteric
- Red P is:
(A) more reactive (B) less reactive polymeric (C) liquid (D) gas
- H_3PO_3 is generally:
(A) reducing (B) not reducing (C) metallic (D) volatile gas

Section B — Short Answer (Attempt any 3) (3 × 2 = 6)

- Name phosphorus allotropes.
- Why is white phosphorus stored under water?
- Define basicity of oxyacid.
- Why is H_3PO_4 monobasic?
- Write PCl_5 hydrolysis reaction.

Section C — Long Answer (Attempt any 1) (1 × 5 = 5)

- Compare white and red phosphorus.
- Explain basicity/reducing behaviour of H_3PO_4 , H_2PO_4^- and HPO_4^{2-} .

Teacher record: MCQ ____/15 | Short ____/6 | Long ____/5 | Presentation/Homework ____/4 | Total ____/30



ARIHANTAM ACADEMY

Faith Strength Education

CLASS 12 CHEMISTRY — BIHAR BOARD (BSEB)

TEACHER ANSWER KEY — DPP 35

p-Block Elements | Phosphorus, oxyacids and chlorides

MCQ answers: 1-A, 2-B, 3-A, 4-C, 5-B, 6-C, 7-B, 8-B, 9-B, 10-B, 11-A, 12-B, 13-B, 14-B, 15-B

Short-answer marking points

- 16. White, red and black.
- 17. It is highly reactive and can ignite in air.
- 18. Number of ionisable O-H hydrogens.
- 19. It has only one O-H bond; others are P-H.
- 20. $\text{PCl}_5 + 4\text{H}_2\text{O} \rightarrow \text{H}_3\text{PO}_4 + 5\text{HCl}$.

Long-answer marking points

- 21. White: P_4 , strained/reactive/poisonous; red: polymeric/less reactive/non-poisonous.
- 22. H_3PO_4 one O-H/two P-H: monobasic/reducing; H_2PO_4^- two O-H/one P-H: dibasic/reducing; HPO_4^{2-} three O-H: tribasic/not reducing.

Remedial rule: Score below 15/26: revise reaction equations, structures and trends; take a 10-MCQ re-test.



ARIHANTAM ACADEMY

Faith Strength Education

CLASS 12 CHEMISTRY — BIHAR BOARD (BSEB)

DAILY PRACTICE PROBLEM — DPP 36

p-Block Elements | Group 16: oxygen, sulphur and sulphur dioxide

Student Name: _____	Roll No.: _____
DPP No.: 36 Chapter: p-Block Elements	Date: _____
Topic: Group 16: oxygen, sulphur and sulphur dioxide	Score: ____ / 30

Instructions: Answer all objective questions. Attempt any 3 short-answer questions and any 1 long-answer question.

Section A — Objective Questions (15 × 1 = 15)

- Group 16 configuration:
(A) ns^2np^2 (B) ns^2np^3 (C) ns^2np^4 (D) ns^2np^5
- O $\cdot$ paramagnetism is due to:
(A) paired electrons (B) unpaired electrons (C) ionic bond (D) large size
- Ozone formula:
(A) O $_2$ (B) O $_3$ (C) O $_4$ (D) O $_5$
- Ozone is a:
(A) reducing agent only (B) strong oxidising agent (C) noble gas (D) metal
- Sulphur allotropes are:
(A) rhombic and monoclinic (B) diamond graphite (C) white red black (D) alpha beta tin
- SO $_2$ is:
(A) basic oxide (B) acidic oxide (C) amphoteric oxide (D) neutral oxide
- SO $_2$ acts as:
(A) oxidising only (B) reducing agent (C) noble gas (D) metal
- SO $_2$ bleaching is:
(A) permanent oxidation (B) temporary reduction (C) chlorination (D) adsorption
- H $_2$ SO $_4$ is made by:
(A) Haber (B) Contact (C) Ostwald (D) Solvay
- Contact catalyst:
(A) Fe (B) Ni (C) V $_2$ O $_5$ (D) Pt-Rh
- Conc. H $_2$ SO $_4$ is:
(A) nonoxidising (B) oxidising/dehydrating (C) basic (D) volatile
- H $_2$ S is:
(A) acidic gas (B) basic gas (C) neutral metal (D) alkaline earth
- H $_2$ S with Pb $^{2+}$ gives:
(A) black PbS (B) white PbCl $_2$ (C) blue solution (D) no change
- S oxidation state in H $_2$ SO $_4$:
(A) -2 (B) 0 (C) +4 (D) +6
- Ozone test:
(A) starch-KI paper (B) lime water (C) litmus (D) AgNO $_3$

Section B — Short Answer (Attempt any 3) (3 × 2 = 6)

- Why is O $\cdot$ paramagnetic?
- What is ozone? Give one use.
- Why does SO $_2$ act as reducing agent?
- What is SO $_2$ bleaching?
- Write Contact-process equations.

Section C — Long Answer (Attempt any 1) (1 × 5 = 5)

- Describe Contact process.
- Compare oxygen and sulphur regarding catenation, oxidation states and hydrides.

Teacher record: MCQ ____/15 | Short ____/6 | Long ____/5 | Presentation/Homework ____/4 | Total ____/30



ARIHANTAM ACADEMY

Faith Strength Education

CLASS 12 CHEMISTRY — BIHAR BOARD (BSEB)

TEACHER ANSWER KEY — DPP 36

p-Block Elements | Group 16: oxygen, sulphur and sulphur dioxide

MCQ answers: 1-C, 2-B, 3-B, 4-B, 5-A, 6-B, 7-B, 8-B, 9-B, 10-C, 11-B, 12-A, 13-A, 14-D, 15-A

Short-answer marking points

- 16. Two unpaired electrons in antibonding orbitals.
- 17. O₃ allotrope of oxygen; water purification/sterilisation.
- 18. S(+4) oxidises to +6.
- 19. Reduction of coloured matter; colour returns in air.
- 20. $2\text{SO}_2 + \text{O}_2 \rightarrow 2\text{SO}_3$; $\text{SO}_2 + \text{H}_2\text{SO}_4 \rightarrow \text{oleum}$; $\text{oleum} + \text{H}_2\text{O} \rightarrow \text{H}_2\text{SO}_4$.

Long-answer marking points

- 21. Steps: SO₂ formation/purification, V₂O₅ oxidation, oleum absorption and dilution.
- 22. S shows more catenation/expanded oxidation states; compare H₂O/H₂S.

Remedial rule: Score below 15/26: revise reaction equations, structures and trends; take a 10-MCQ re-test.



ARIHANTAM ACADEMY

Faith Strength Education

CLASS 12 CHEMISTRY — BIHAR BOARD (BSEB)

DAILY PRACTICE PROBLEM — DPP 37

p-Block Elements | Sulphuric acid, SO_2 and H_2S

Student Name: _____	Roll No.: _____
DPP No.: 37 Chapter: p-Block Elements	Date: _____
Topic: Sulphuric acid, SO_2 and H_2S	Score: ____ / 30

Instructions: Answer all objective questions. Attempt any 3 short-answer questions and any 1 long-answer question.

Section A — Objective Questions (15 × 1 = 15)

- Oleum formula:
(A) H_2SO_4 (B) $\text{H}_2\text{S}_2\text{O}_8$ (C) $\text{H}_2\text{S}_2\text{O}_7$ (D) H_2SO_3
- Conc. H_2SO_4 is good:
(A) drying agent (B) base (C) noble gas (D) reductant only
- H_2SO_4 cannot dry:
(A) HCl (B) NH_3 (C) SO_2 (D) CO_2
- H_2SO_4 high bp due to:
(A) H-bonding (B) low mass (C) metallic bonding (D) ionic solid only
- H_2S is:
(A) strong acid (B) weak acid (C) strong base (D) neutral
- H_2S lab preparation:
(A) $\text{ZnS} + \text{dil HCl}$ (B) $\text{NaCl} + \text{H}_2\text{SO}_4$ (C) $\text{CuSO}_4 + \text{Zn}$ (D) $\text{Fe}_2\text{O}_3 + \text{HCl}$
- SO_2 decolourises KMnO_4 by being:
(A) oxidised to sulphate (B) reduced to sulphide (C) inert (D) basic
- SO_2 changes acidified dichromate:
(A) orange to green (B) green to orange (C) blue to red (D) colourless to blue
- Cu with conc H_2SO_4 gives:
(A) H_2 (B) SO_2 (C) O_2 (D) H_2S
- Zn with dil H_2SO_4 gives:
(A) SO_2 (B) H_2 (C) O_2 (D) Cl_2
- H_2SO_4 is dibasic due to:
(A) two O-H groups (B) two S atoms (C) two O atoms (D) two lone pairs
- Thiosulphate ion:
(A) SO_3^{2-} (B) $\text{S}_2\text{O}_3^{2-}$ (C) $\text{S}_2\text{O}_4^{2-}$ (D) SO_4^{2-}
- $\text{Na}_2\text{S}_2\text{O}_3$ use:
(A) photography (B) Haber (C) soap (D) cement
- Aqua regia:
(A) $\text{HCl} + \text{HNO}_3$ (B) $\text{HCl} + \text{H}_2\text{SO}_4$ (C) $\text{HNO}_3 + \text{H}_2\text{SO}_4$ (D) $\text{HCl} + \text{HF}$
- Ozone oxidises I^- to:
(A) I_2 (B) IO_3^- (C) no change (D) S^{2-}

Section B — Short Answer (Attempt any 3) (3 × 2 = 6)

- Why is conc H_2SO_4 a drying agent?
- Why cannot it dry NH_3 ?
- Write reactions of H_2SO_4 with Cu and Zn.
- What is oleum?
- Why is SO_2 reducing?

Section C — Long Answer (Attempt any 1) (1 × 5 = 5)

- Explain properties and uses of H_2SO_4 .
- Describe preparation/properties/uses of SO_2 and H_2S .

Teacher record: MCQ ____/15 | Short ____/6 | Long ____/5 | Presentation/Homework ____/4 | Total ____/30



ARIHANTAM ACADEMY

Faith Strength Education

CLASS 12 CHEMISTRY — BIHAR BOARD (BSEB)

TEACHER ANSWER KEY — DPP 37

p-Block Elements | Sulphuric acid, SO_2 and H_2S

MCQ answers: 1-B, 2-A, 3-B, 4-A, 5-B, 6-A, 7-A, 8-A, 9-B, 10-B, 11-A, 12-B, 13-A, 14-A, 15-A

Short-answer marking points

16. Nonvolatile, hygroscopic/dehydrating.

17. NH_3 reacts to form ammonium sulphate.

18. $\text{Cu} + 2\text{H}_2\text{SO}_4(\text{conc}) \rightarrow \text{CuSO}_4 + \text{SO}_2 + 2\text{H}_2\text{O}$; $\text{Zn} + \text{H}_2\text{SO}_4(\text{dil}) \rightarrow \text{ZnSO}_4 + \text{H}_2$.

19. H_2S , SO_2 in H_2SO_4 .

20. S(+4) can oxidise to +6.

Long-answer marking points

21. Cover acidic, dibasic, oxidising, dehydrating, nonvolatile properties, reactions and industrial uses.

22. Include lab preparation and chemical properties: SO_2 reducing/bleaching; H_2S acidic/reducing and metal sulphide precipitation.

Remedial rule: Score below 15/26: revise reaction equations, structures and trends; take a 10-MCQ re-test.



ARIHANTAM ACADEMY

Faith Strength Education

CLASS 12 CHEMISTRY — BIHAR BOARD (BSEB)

DAILY PRACTICE PROBLEM — DPP 38

p-Block Elements | Group 17: halogens, chlorine and bleaching powder

Student Name: _____	Roll No.: _____
DPP No.: 38 Chapter: p-Block Elements	Date: _____
Topic: Group 17: halogens, chlorine and bleaching powder	Score: ____ / 30

Instructions: Answer all objective questions. Attempt any 3 short-answer questions and any 1 long-answer question.

Section A — Objective Questions (15 × 1 = 15)

- Halogen configuration:
(A) ns^2np^3 (B) ns^2np^4 (C) ns^2np^5 (D) ns^2np^6
- Most electronegative:
(A) Cl (B) F (C) Br (D) I
- F shows oxidation state:
(A) -1 only (B) +1 only (C) +3 only (D) +5 only
- F anomalous due to:
(A) large size (B) small size/no d orbitals (C) metallic nature (D) low EN
- Interhalogen contains:
(A) same halogen (B) two different halogens (C) metal+halogen (D) oxygen only
- Cl_2 preparation uses MnO_2 and:
(A) dil HCl (B) conc HCl (C) H_2SO_4 (D) NaOH
- Cl_2 in water gives:
(A) $HCl+HOCl$ (B) $HClO_2$ only (C) Cl_2 only (D) H^++O_2
- Chlorine bleaching is:
(A) reduction (B) oxidation by $HOCl$ (C) adsorption (D) dehydration
- Bleaching powder formula:
(A) $CaOCl_2$ (B) $CaCl_2$ (C) $Ca(OH)_2$ (D) $CaClO_2$
- Bleaching powder made by Cl_2 over:
(A) dry slaked lime (B) NaCl (C) $CaCO_3$ (D) lime water
- I_2 + starch gives:
(A) blue (B) red (C) green (D) colourless
- HF attacks glass due to reaction with:
(A) SiO_2 (B) NaCl (C) $CaCO_3$ (D) H_2O
- Aqua regia ratio is:
(A) $3HCl:1HNO_3$ (B) $1HCl:3HNO_3$ (C) 1:1 (D) $HCl:H_2SO_4$
- Chlorine water stored dark because:
(A) $HOCl$ decomposes in light (B) Cl_2 is metal (C) HCl freezes (D) water boils
- Halogens are strong:
(A) reducing agents (B) oxidising agents (C) bases (D) metals

Section B — Short Answer (Attempt any 3) (3 × 2 = 6)

- Why is fluorine anomalous?
- Why does F show only -1 state?
- Write lab preparation of Cl_2 .
- Explain chlorine bleaching.
- Define interhalogen compounds.

Section C — Long Answer (Attempt any 1) (1 × 5 = 5)

- Compare fluorine with other halogens.
- Describe chlorine and bleaching powder: preparation, properties and uses.

Teacher record: MCQ ____/15 | Short ____/6 | Long ____/5 | Presentation/Homework ____/4 | Total ____/30



ARIHANTAM ACADEMY

Faith Strength Education

CLASS 12 CHEMISTRY — BIHAR BOARD (BSEB)

TEACHER ANSWER KEY — DPP 38

p-Block Elements | Group 17: halogens, chlorine and bleaching powder

MCQ answers: 1-C, 2-B, 3-A, 4-B, 5-B, 6-B, 7-A, 8-B, 9-A, 10-A, 11-A, 12-A, 13-A, 14-A, 15-B

Short-answer marking points

16. Small size, high EN/IE, no d orbitals and weak F-F bond.

17. No d orbitals to expand octet and highest EN.

18. $\text{MnO}_2 + 4\text{HCl}(\text{conc}) \rightarrow \text{MnCl}_2 + \text{Cl}_2 + 2\text{H}_2\text{O}$.

19. $\text{Cl}_2 + \text{H}_2\text{O} \rightleftharpoons \text{HCl} + \text{HOCl}$; HOCl oxidises coloured matter.

20. Compounds with two different halogens: ClF_3 , BrF_3 , IF_5 .

Long-answer marking points

21. Compare size, bond enthalpy, oxidation states, HF and d-orbital absence.

22. Include Cl_2 preparation/reactions/bleaching; bleaching powder formation and applications.

Remedial rule: Score below 15/26: revise reaction equations, structures and trends; take a 10-MCQ re-test.



ARIHANTAM ACADEMY

Faith Strength Education

CLASS 12 CHEMISTRY — BIHAR BOARD (BSEB)

DAILY PRACTICE PROBLEM — DPP 39

p-Block Elements | Hydrogen halides, interhalogens and oxoacids

Student Name: _____	Roll No.: _____
DPP No.: 39 Chapter: p-Block Elements	Date: _____
Topic: Hydrogen halides, interhalogens and oxoacids	Score: ____ / 30

Instructions: Answer all objective questions. Attempt any 3 short-answer questions and any 1 long-answer question.

Section A — Objective Questions (15 × 1 = 15)

- Acid strength of HX increases:
(A) $\text{HF} > \text{HCl} > \text{HBr} > \text{HI}$ (B) $\text{HI} > \text{HBr} > \text{HCl} > \text{HF}$ (C) $\text{HCl} > \text{HF} > \text{HBr} > \text{HI}$ (D) all equal
- HF weak because:
(A) weak H-F bond (B) strong H-F bond/H bonding (C) large size (D) low polarity
- HCl gives white fumes with:
(A) NH_3 (B) O_2 (C) N_2 (D) CO_2
- Halogen oxidising power decreases:
(A) $\text{F}_2 > \text{Cl}_2 > \text{Br}_2 > \text{I}_2$ (C) $\text{I}_2 > \text{Br}_2 > \text{Cl}_2 > \text{F}_2$ (D) all equal
- Halide reducing power increases:
(A) $\text{F}_2 > \text{Cl}_2 > \text{Br}_2 > \text{I}_2$ (B) $\text{I}_2 > \text{Br}_2 > \text{Cl}_2 > \text{F}_2$ (C) all equal (D) $\text{Cl}_2 > \text{F}_2 > \text{Br}_2 > \text{I}_2$
- HCl is oxidised by MnO_2 to:
(A) Cl_2 (B) H_2 (C) O_2 (D) HClO
- Strongest chlorine oxoacid oxidant:
(A) HClO (B) HClO_2 (C) HClO_3 (D) HClO_4
- ICl is:
(A) interhalogen (B) oxoacid (C) halide ion (D) noble gas
- ClF_3 shape:
(A) linear (B) T-shaped (C) trigonal planar (D) tetrahedral
- IF_5 shape:
(A) pentagonal bipyramidal (B) octahedral (C) square planar (D) linear
- Iodine purification:
(A) sublimation (B) distillation (C) electrolysis (D) froth
- Cl_2 with AgNO_3 gives:
(A) white AgCl (B) yellow AgI (C) cream AgBr (D) black Ag_2S
- AgCl dissolves in:
(A) NH_4OH (B) H_2SO_4 (C) NaCl (D) water completely
- HOCl formula:
(A) HClO (B) HClO_2 (C) HClO_3 (D) HClO_4
- Interhalogens are usually:
(A) less reactive than all halogens (B) more reactive than parent halogens except F_2 (C) inert (D) metals

Section B — Short Answer (Attempt any 3) (3 × 2 = 6)

- Why is HF weak?
- Arrange halide ions by reducing strength.
- Why is HCl stronger acid than HF?
- Give shapes of ClF_3 and IF_5 .
- Give AgNO_3 test for Cl_2 .

Section C — Long Answer (Attempt any 1) (1 × 5 = 5)

- Explain acid strength of HX and oxidising strength of halogens.
- Describe interhalogens: types, formulas, structures and importance.

Teacher record: MCQ ____/15 | Short ____/6 | Long ____/5 | Presentation/Homework ____/4 | Total ____/30



ARIHANTAM ACADEMY

Faith Strength Education

CLASS 12 CHEMISTRY — BIHAR BOARD (BSEB)

TEACHER ANSWER KEY — DPP 39

p-Block Elements | Hydrogen halides, interhalogens and oxoacids

MCQ answers: 1-B, 2-B, 3-A, 4-B, 5-B, 6-A, 7-D, 8-A, 9-B, 10-A, 11-A, 12-A, 13-A, 14-A, 15-B

Short-answer marking points

16. Strong H-F bond and H-bonding reduce ionisation.

17. $I_2 > Br_2 > Cl_2 > F_2$.

18. H-Cl bond weaker, hence ionises more in water.

19. ClF_3 T-shaped; IF_5 pentagonal bipyramidal.

20. $AgNO_3 + Cl^- \rightarrow AgCl$ white, soluble in NH_4OH .

Long-answer marking points

21. Acid strength rises down group due to weaker H-X bond; oxidising strength falls down group.

22. AX, AX₂, AX₃, AX₄ types; examples/shapes; used as fluorinating agents.

Remedial rule: Score below 15/26: revise reaction equations, structures and trends; take a 10-MCQ re-test.



ARIHANTAM ACADEMY

Faith Strength Education

CLASS 12 CHEMISTRY — BIHAR BOARD (BSEB)

DAILY PRACTICE PROBLEM — DPP 40

p-Block Elements | Group 18: noble gases and xenon compounds

Student Name: _____	Roll No.: _____
DPP No.: 40 Chapter: p-Block Elements	Date: _____
Topic: Group 18: noble gases and xenon compounds	Score: ____ / 30

Instructions: Answer all objective questions. Attempt any 3 short-answer questions and any 1 long-answer question.

Section A — Objective Questions (15 × 1 = 15)

- Noble-gas configuration (except He):
(A) ns^2np^4 (B) ns^2np^5 (C) ns^2np^6 (D) ns^2np^7
- He configuration:
(A) $1s^1$ (B) $1s^2$ (C) $2s^2$ (D) $2p^1$
- Noble gases inert due to:
(A) low IE (B) complete shell (C) metal bond (D) large size only
- Radioactive noble gas:
(A) He (B) Ne (C) Ar (D) Rn
- Xenon compounds mainly with:
(A) O/F (B) Na/K (C) C/H only (D) Cl only
- XeF_4 shape:
(A) bent (B) linear (C) trigonal planar (D) tetrahedral
- XeF_6 shape:
(A) square planar (B) tetrahedral (C) trigonal bipyramidal (D) octahedral
- XeF_4 shape:
(A) distorted octahedral (B) linear (C) square planar (D) T-shaped
- XeF_4 hydrolysis gives:
(A) $\text{Xe/O}_2/\text{HF}$ (B) XeO_2 only (C) XeF_4 only (D) no reaction
- XeF_4 hydrolysis gives:
(A) XeO_2 (B) XeO_2 only (C) XeF_4 (D) no reaction
- XeO_3 shape:
(A) trigonal pyramidal (B) linear (C) tetrahedral (D) square planar
- XeO_4 shape:
(A) tetrahedral (B) square planar (C) linear (D) octahedral
- He balloons are safe because:
(A) heavy (B) light/nonflammable (C) reactive (D) poisonous
- Xe used in:
(A) high-intensity lamps (B) fertiliser (C) soap (D) cement
- Noble gases in bulbs because:
(A) they are inert (B) they oxidise filament (C) they are liquids (D) they remove glass

Section B — Short Answer (Attempt any 3) (3 × 2 = 6)

- Why are noble gases inert?
- Why can Xe form compounds?
- Give shapes of XeF_4 , XeF_6 , XeF_2 .
- Write hydrolysis of XeF_4 .
- Give two uses of He.

Section C — Long Answer (Attempt any 1) (1 × 5 = 5)

- Explain preparation/properties/structures of xenon fluorides.
- Discuss uses of noble gases.

Teacher record: MCQ ____/15 | Short ____/6 | Long ____/5 | Presentation/Homework ____/4 | **Total** ____/30



ARIHANTAM ACADEMY

Faith Strength Education

CLASS 12 CHEMISTRY — BIHAR BOARD (BSEB)

TEACHER ANSWER KEY — DPP 40

p-Block Elements | Group 18: noble gases and xenon compounds

MCQ answers: 1-C, 2-B, 3-B, 4-D, 5-A, 6-B, 7-A, 8-A, 9-A, 10-A, 11-A, 12-A, 13-B, 14-A, 15-A

Short-answer marking points

16. Complete shell, high ionisation enthalpy and low electron affinity.

17. Comparatively lower IE; reacts with F/O.

18. Linear, square planar, distorted octahedral.

19. $2\text{XeF}_4 + 2\text{H}_2\text{O} \rightarrow 2\text{Xe} + 4\text{HF} + \text{O}_2$.

20. Balloons/diving mixtures; cryogenic cooling.

Long-answer marking points

21. Controlled direct fluorination, VSEPR geometry, hydrolysis and oxidising nature.

22. He balloons/cryogenics; Ne signs; Ar bulbs/welding; Kr/Xe lamps.

Remedial rule: Score below 15/26: revise reaction equations, structures and trends; take a 10-MCQ re-test.



ARIHANTAM ACADEMY

Faith Strength Education

CLASS 12 CHEMISTRY — BIHAR BOARD (BSEB)

DAILY PRACTICE PROBLEM — DPP 41

p-Block Elements | Full p-block important-question test

Student Name: _____	Roll No.: _____
DPP No.: 41 Chapter: p-Block Elements	Date: _____
Topic: Full p-block important-question test	Score: ____ / 30

Instructions: Answer all objective questions. Attempt any 3 short-answer questions and any 1 long-answer question.

Section A — Objective Questions (15 × 1 = 15)

- Group 15 configuration:
(A) ns^2np^2 (B) ns^2np^3 (C) ns^2np^4 (D) ns^2np^5
- N inert due to:
(A) weak bond (B) triple bond (C) large size (D) metallic nature
- H_3PO_4 is:
(A) monobasic (B) dibasic (C) tribasic (D) tetrabasic
- O paramagnetic due to:
(A) paired electrons (B) unpaired electrons (C) ionic bond (D) large size
- Contact catalyst:
(A) Fe (B) Ni (C) V_2O_5 (D) Pt-Rh
- F oxidation state:
(A) -1 only (B) +1 (C) +3 (D) +5
- Bleaching powder:
(A) $CaCl_2$ (B) $CaOCl_2$ (C) $Ca(OH)_2$ (D) $CaClO_2$
- HF weak due to:
(A) weak bond (B) strong H-F bond (C) large size (D) low polarity
- Noble gas outer configuration:
(A) ns^2np^4 (B) ns^2np^5 (C) ns^2np^6 (D) ns^2np^3
- XeF_4 is:
(A) bent (B) linear (C) trigonal planar (D) tetrahedral
- XeF_6 is:
(A) tetrahedral (B) square planar (C) T-shaped (D) octahedral
- NH_3 shape:
(A) linear (B) trigonal planar (C) trigonal pyramidal (D) square planar
- SO_2 bleaching:
(A) permanent oxidation (B) temporary reduction (C) chlorination (D) adsorption
- Chlorine bleaching:
(A) reduction (B) oxidation (C) dehydration (D) neutralisation
- I-starch colour:
(A) red (B) blue (C) green (D) colourless

Section B — Short Answer (Attempt any 3) (3 × 2 = 6)

- Why is N inert?
- Why is H_3PO_4 monobasic?
- Write Contact-process equations.
- Why is F anomalous?
- Give shape of XeF_4 .

Section C — Long Answer (Attempt any 1) (1 × 5 = 5)

- Compare nitrogen and phosphorus.
- Describe Contact process and properties of H_2SO_4 .

Teacher record: MCQ ____/15 | Short ____/6 | Long ____/5 | Presentation/Homework ____/4 | Total ____/30



ARIHANTAM ACADEMY

Faith Strength Education

CLASS 12 CHEMISTRY — BIHAR BOARD (BSEB)

TEACHER ANSWER KEY — DPP 41

p-Block Elements | Full p-block important-question test

MCQ answers: 1-B, 2-B, 3-A, 4-B, 5-C, 6-A, 7-B, 8-B, 9-A, 10-B, 11-B, 12-C, 13-B, 14-B, 15-B

Short-answer marking points

16. High $\text{N}\equiv\text{N}$ bond energy.

17. Only one ionisable O-H bond.

18. $2\text{SO}_2 + \text{O}_2 \rightarrow 2\text{SO}_3$; $\text{SO}_2 + \text{H}_2\text{SO}_4 \rightarrow \text{H}_2\text{S}_2\text{O}_7$; dilution gives H_2SO_4 .

19. Small size, high EN/IE, no d orbitals.

20. Square planar.

Long-answer marking points

21. Compare size, bonding, oxidation states/allotropy and d-orbital availability.

22. Explain Contact steps and acidic/dibasic/oxidising/dehydrating/nonvolatile properties.

Remedial rule: Score below 15/26: revise reaction equations, structures and trends; take a 10-MCQ re-test.