

JEE MAIN CHEMICAL BONDING AND MOLECULAR STRUCTURE — HYBRIDISATION — PYQS

Max. Marks: 28
Questions: 7

Section A (MCQ) — 6 questions

Q.1 Among the following, the CORRECT combinations are

- A. $\text{IF}_3 \rightarrow$ T-shaped (sp^3d)
 B. $\text{IF}_5 \rightarrow$ Square pyramidal (sp^3d^2)
 C. $\text{IF}_7 \rightarrow$ Pentagonal bipyramidal (sp^3d^3)
 D. $\text{ClO}_4^- \rightarrow$ Square planar (sp^2d)

Choose the correct answer from the options given below:

[JEE Main 2026 (Online) 24th January Morning Shift]

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



Q.2 Two p-block elements X and Y form fluorides of the type EF_3 . The fluoride compound XF_3 is a Lewis acid and YF_3 is a Lewis base. The hybridizations of the central atoms of XF_3 and YF_3 respectively are

[JEE Main 2026 (Online) 22nd January Morning Shift]

- (1) sp^2 and sp^3 (2) Both sp^3
 (3) Both sp^2 (4) sp^3 and sp^2



Q.3 In SO_2 , NO_2^- and N_3^- , the hybridizations at the central atom are respectively :

[JEE Main 2025 (Online) 7th April Evening Shift]

- (1) sp^2 , sp^2 and sp^2 (2) sp , sp^2 and sp
 (3) sp^2 , sp and sp (4) sp^2 , sp^2 and sp



Q.4 Match the LIST-I with LIST-II

LIST-I (Molecules/ion)		LIST-II (Hybridisation of central atom)	
A.	PF_5	I.	dsp^2
B.	SF_6	II.	sp^3d
C.	$\text{Ni}(\text{CO})_4$	III.	sp^3d^2
D.	$[\text{PtCl}_4]^{2-}$	IV.	sp^3

Choose the correct answer from the options given below: [JEE Main 2025 (Online) 3rd April Morning Shift]

- (1) A-IV, B-I, C-II, D-III (2) A-III, B-I, C-IV, D-II
 (3) A-II, B-III, C-IV, D-I (4) A-I, B-II, C-III, D-IV

Scan or tap for the full solution



Q.5 Among SO_2 , NF_3 , NH_3 , XeF_2 , ClF_3 and SF_4 , the hybridization of the molecule with nonzero dipole moment and highest number of lone-pairs of electrons on the central atom is

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

- (1) sp^3 (2) dsp^2 (3) sp^3d^2 (4) sp^3d

Scan or tap for the full solution



Q.6 Which among the following molecules is (a) involved in sp^3d hybridization, (b) has different bond lengths and (c) has lone pair of electrons on the central atom?

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

- (1) XeF_4 (2) XeF_2 (3) PF_5 (4) SF_4

Scan or tap for the full solution



Section B (Numerical) — 1 question

Q.7 Consider the following species:
 BrF_5 , XeF_5^- , BF_4^- , ICl_4^- , XeF_4 , SF_4 , NH_4^+ , ClF_3 , XeF_2 , ICl_2^-
 Number of species having sp^3d hybridized central atom is _____.

[JEE Main 2026 (Online) 5th April Morning Shift]

Scan or tap for the full solution



ANSWER KEY

Section A (MCQ) — 6 questions

Ques.	1	2	3	4	5	6				
Ans.	3	1	4	3	4	4				

Section B (Numerical) — 1 question

Ques.	7									
Ans.	4									