

Topic : Chemical Bonding

Type of Questions

Single choice Objective ('-1' negative marking) Q.1 to Q.6

(3 marks, 3 min.)

M.M., Min.

[18, 18]

Multiple choice objective ('-1' negative marking) Q.7

(4 marks, 4 min.)

[4, 4]

Subjective Questions ('-1' negative marking) Q.8

(4 marks, 5 min.)

[4, 5]

- Carbon atoms in $C_2(CN)_2$ are :
 (A) All sp -hybridised (B) All sp^2 -hybridised (C) All sp^3 -hybridised (D) sp and sp^2 -hybridised.
- $BF_3 + F^- \rightarrow BF_4^-$
 What is the hybridisation state of B in BF_3 and BF_4^- :
 (A) sp^2, sp^3 (B) sp^3, sp^3 (C) sp^2, sp^2 (D) sp^3, sp^3d
- The hybridisation of P in phosphate ion (PO_4^{3-}) is the same as :
 (A) I in ICl_4^- (B) S in SO_3 (C) N in NO_3^- (D) S in SO_3^{2-}
- Specify the hybridisations of central atom in the following species respectively $\{N_3^-, NOCl, N_2O\}$
 (A) sp, sp^2, sp (B) sp, sp, sp^3 (C) sp^2, sp, sp (D) sp^2, sp^2, sp .
- The correct order of increasing s character (in percentage) in the hybrid orbitals in below molecules / ions is (assume all hybrid orbitals are exactly equivalent) :

CO_3^{2-} I	XeF_4 II	I_3^- III	NCI_3 IV	$BeCl_2(g)$ V
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 (A) $II < III < IV < I < V$ (B) $II < IV < III < V < I$
 (C) $III < II < I < V < IV$ (D) $II < IV < III < I < V$
- Consider the following statements :
 In $CH_2 = \overset{I}{CH} - \overset{II}{CH} - \overset{III}{C} \equiv \overset{IV}{C} - H$
 1. There are 6 σ and 3 π bonds.
 2. Carbon I & II are sp^2 hybridised.
 3. Carbon III & IV are sp hybridised.
 The above statements 1, 2, 3 respectively are (T = True, F = False) :
 (A) T T T (B) F T T (C) F T F (D) T F T
- * Which of the following species have linear shape with central atom sp hybridised :
 (A) NO_2^+ (B) SCN^- (C) $HgCl_2$ (D) C_2H_2
- Predict the hybridisation of the central atom in following molecules :

1. $BeH_2(g)$	2. BeF_2
3. CO_2	4. $HC \equiv CH$
5. O_3	6. BF_3
7. $CH_2=CH_2$	8. CH_3^+
9. HNO_3	10. HNO_2
11. SO_2	12. SO_3
13. HCO_3^-	14. $HCOO^-$
15. $SnCl_2$	16. $AlCl_3$
17. AlH_4^-	18. NF_3
19. PF_3	20. $AsCl_3$
21. CH_3^-	22. OF_2
23. SCl_2	24. SF_4
25. $[SiF_6]^{2-}$	26. PCl_6^-
27. ICl_2^-	28. ICl_5
29. ICl_4^-	30. XeF_6



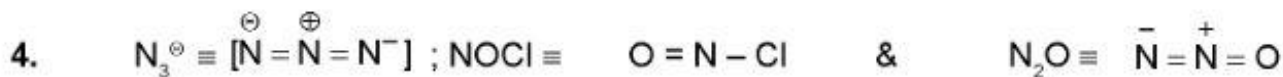
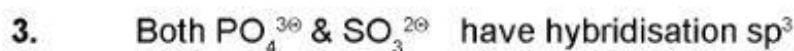
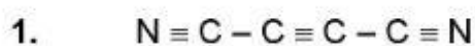
Answer Key

DPP No. # 12

1. (A) 2. (A) 3. (D) 4. (A) 5. (A)
6. (B) 7.* (ABCD)

Hints & Solutions

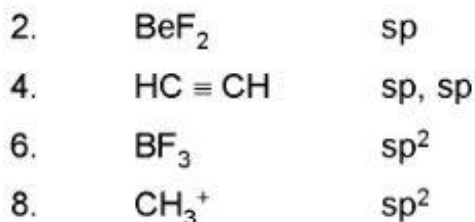
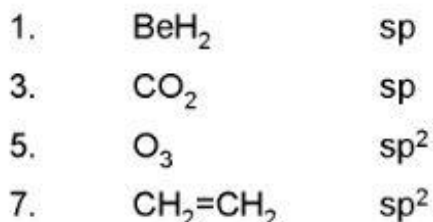
DPP No. # 12



5.

Species	Hybridisation
CO_3^{2-}	sp^2
XeF_4	sp^3d^2
I_3^+	sp^3d
NCl_3	sp^3
BeCl_2	sp

8.



9.	HNO_3	sp^2	10.	HNO_2	sp^2
11.	SO_2	sp^2	12.	SO_3	sp^2
13.	HCO_3^-	sp^2	14.	HCOO^-	sp^2
15.	SnCl_2	sp^2	16.	AlCl_3	sp^2
17.	AlH_4^-	sp^3	18.	NF_3	sp^3
19.	PF_3	sp^3	20.	AsCl_3	sp^3
21.	CH_3^-	sp^3	22.	OF_2	sp^3
23.	SCl_2	sp^3	24.	SF_4	sp^3d
25.	$[\text{SiF}_6]^{2-}$	sp^3d^2	26.	PCl_6^-	sp^3d^2
27.	ICl_2^-	sp^3d	28.	ICl_5	sp^3d^2
29.	ICl_4^-	sp^3d^2	30.	XeF_6	sp^3d^3

