INORGANIC CHEMISTRY

DPP
DAILY PRACTICE PROBLEMS

DPP No. 15

Total Marks : 27

Max. Time : 28 min.

Topic : Chemical Bonding

Type of Questions		M.M., Min.
Single choice Objective ('–1' negative marking) Q.1 to Q.5	(3 marks, 3 min.)	[15, 15]
Multiple choice objective ('–1' negative marking) Q.6 to Q.7	(4 marks, 4 min.)	[8, 8]
Subjective Questions ('–1' negative marking) Q.8	(4 marks, 5 min.)	[4, 5]

1. Correct order of bond length is

(A) $SO_3^{2-} > SO_4^{2-} > SO_3$ (B) $SO_4^{2-} > SO_3^{2-} > SO_3$

(C) $SO_3 > SO_3^{2-} > SO_4^{2-}$ (D) None of these.

2. Which of the following molecule contains shortest N–O bond ?

(A) NOF (B) NO_2^- (C) NO_3^- (D) NH_2OH

3. How many types of bond length are there in SO_4^{2-} ?

(A) one (B) two (C) three (D) four

4. Select the correct order for bond angle.

(A) $PH_3 < AsH_3 < NH_3 < SbH_3$ (B) $F_2O < H_2O < Cl_2O$

(C) $SbI_3 < SbBr_3 < SbCl_3$ (D) $BF_3 > BCl_3 > BBr_3$

5. Select the correct order of bond angle of the following species.

ClO_3^-, BrO_3^-, IO_3^-

(A) $BrO_3^- > IO_3^- > ClO_3^-$ (B) $ClO_3^- > BrO_3^- > IO_3^-$

(C) $IO_3^- > BrO_3^- > ClO_3^-$ (D) $IO_3^- < BrO_3^- > ClO_3^-$

6.* Which of the following order is/are correct about the bond angle.

(A) $OF_2 < H_2O < Cl_2O < ClO_2$ (B) $COF_2 < COCl_2 < COBr_2 < COI_2$ ($\widehat{XCX}$ bond angle)

(C) $PH_3 > PF_3$ (D) $KrF_4 < SF_2 < N_2H_2$

7.* CO_3^{2-} anion has which of the following charcteristics

(A) Bonds of unequal length (B) sp^2 hybridisation of C atom

(C) Resonance stabilization (D) Same bond angles.

8. Compare bond angles in the following pairs :

(a) F_2O and H_2O (b) NH_3 and PH_3 (c) SO_2 and SO_3 (d) NO_2^+ and NO_2^-

Answer Key

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1.	(A)	**2.**	(A)	**3.**	(A)	**4.**	(B)	**5.**	(B)
6.*	(ABD)	**7.***	(BCD)						

8. (a) $F_2O < H_2O$ (b) $NH_3 > PH_3$ (c) $SO_2 < SO_3$ (d) $NO_2^+ > NO_2^-$

Hints & Solutions

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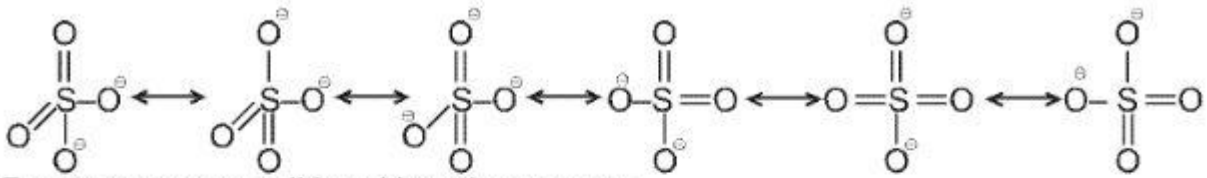
3.



Due to resonance all bond length are same.

4. (A) NH_3 (106.6°) > PH_3 (93.8°) > AsH_3 (91.83°) > SbH_3 (91.3°) – bond angle
(B) Cl_2O (110.9°) > H_2O (104.5°) > F_2O (103.3°)
(C) SbI_3 (99°) > $SbBr_3$ (98.2°) > $SbCl_3$ (97.1°)
(D) All are trigonal planar (bond angle 120°).

5. Bond angle x size of central atom (if all other factors are same.

6.* All given order are correct

OF_2 < H_2O < Cl_2O < ClO_2
sp^3 sp^3 sp^3 sp^3
low bp-bp repulsion larger size of Cl

$COF_2 < COCl_2 < COBr_2 < COI_2$ ($x\hat{C}x$ bond angle)

$PH_3 < PF_3$
92° 97.7°

KrF_4 > SF_2 < N_2H_2
sp^3d^2 Sp^3 sp^2 (< 120°)
(90°C) (< 109°28') sp^2(< 120°)

8. (a) $F_2O < H_2O$ (b) $NH_3 > PH_3$ (c) $SO_2 < SO_3$ (d) $NO_2^+ > NO_2^-$