Nishant Jindal

CHEMICAL BONDING

Q. Select the correct statement for H_2 molecule

(A) On time average the molecule is non-polar but at the particular moment it may act as a dipole which is equally probable in all directions

(B) On time average the molecule is polar but at the particular moment it does not act as a dipole.

(C) On time average the molecule is non-polar and the particular moment it does not act as dipole.

(D) All are incorrect

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Q. Select the correct order of B.P.

(A) $BF_3 > BMe_3$

(B) $BF_3 < BMe_3$

(C) $BF_3 = BMe_3$

(D) None of these

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CHEMICAL BONDING

Q. Select the correct statement

(A) Boiling point of inert gases decreases down the group

(B) Boiling point of inert gases increases down the group

(C) Boiling point of $H_2 < He$

(D) None of these

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CHEMICAL BONDING

Q. Statement 1 : Experimentally 100% covalent bond formation is not possible

Statement 2 : Non-polar molecule has instantaneous dipole - induced dipole interaction

(A) Statement-1 is true, statement-2 is true and statement- 2 is correct explanation for statement-1.

(B) Statement-1 is true, statement-2 is true and statement- 2 is NOT the correct explanation for statement- 1.

(C) Statement-1 is true, statement-2 is false.

(D) Statement-1 is false, statement- 2 is true.

CHEMICAL BONDING

Q. Statement 1 : CCl_4 has lower boiling point than that of $SiCl_4$

Statement 2 : The magnitude of negative charge developed at chlorine atoms in $SiCl_4$ is more in comparison to negative charge developed at chlorine atoms in CCl_4

(A) Statement- 1 is true, statement- 2 is true and statement- 2 is correct explanation for statement-1.

(B) Statement-1 is true, statement- 2 is true and statement- 2 is NOT the correct explanation for statement- 1 .

(C) Statement-1 is true, statement-2 is false.

(D) Statement-1 is false, statement- 2 is true.

$CCl_4 > SiCl_4$

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CHEMICAL BONDING

Q. London force works in

(A) Polar molecule

(B) Non-polar molecule

(C) All polar and non-polar molecule

(D) Only in polar molecule

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CHEMICAL BONDING

MC Q

Q. London forces depends upon

(A) Molecular weight

(B) Number of polarisable electron

(C) Molecular size

(D) None of these

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CHEMICAL BONDING

MCQ

Q. Which of the following order(s) is/are correct ?

(A) $D_2O > H_2O$ (Order of strength of keesom force)

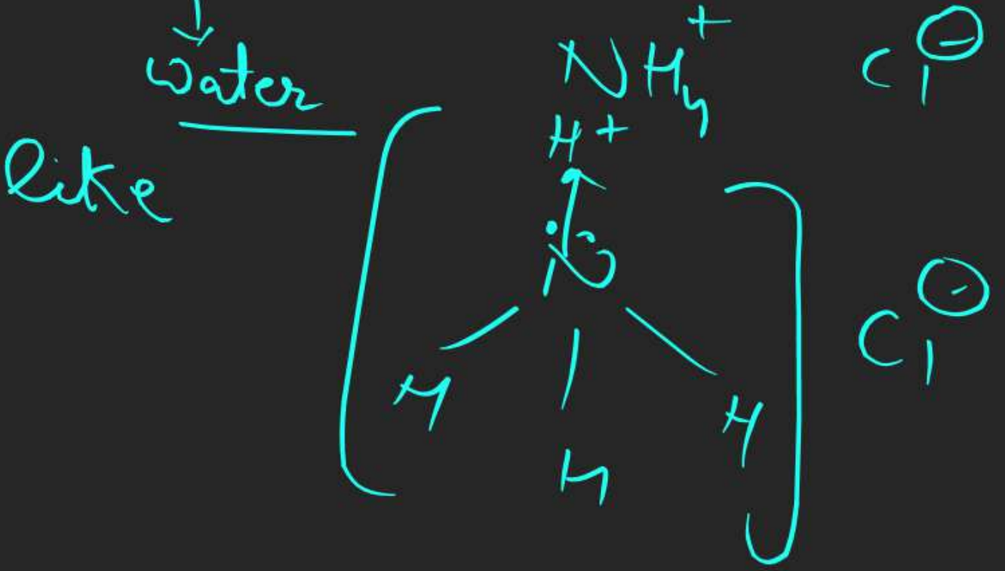
(B) $NF_3 < NMe_3$ (Boiling Point)

(C) $Me_4NCl > NH_4Cl$ (solubility in non polar solvent)

(D) $Me_4NCl > NH_4Cl$ (solubility in polar solvent)

water

like dissolve like



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CHEMICAL BONDING

The existence of intermolecular forces is supported by the facts : non ideality of real gases, Joule - thomson effect, liquefaction of gases. The electrical field of a dipole can induce a dipole moment in adjacent molecule (which may be polar or non polar) then the induced dipole can interact electrostatically with the polarising dipole.

Q. The strongest force among the following is

(A) London force

(B) Ion - dipole interaction

(C) Dipole - induced dipole interaction

(D) Dipole - dipole interaction

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CHEMICAL BONDING

The existence of intermolecular forces is supported by the facts : non ideality of real gases, Joule - thomson effect, liquefaction of gases. The electrical field of a dipole can induce a dipole moment in adjacent molecule (which may be polar or non polar) then the induced dipole can interact electrostatically with the polarising dipole.

Q. Select the correct statement :

(A) Boiling point of NF_3 is greater than NMe_3

(B) Greater the dipole moment in molecule, greater will be the dipole-dipole interaction between the molecules.

(C) London dispersion force increases with decreasing number of electrons

(D) Boiling point of hydrides of carbon family decreases down the group.

$CH_4 < SiH_4 < GeH_4 < SnH_4 < PbH_4$

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CHEMICAL BONDING

The existence of intermolecular forces is supported by the facts : non ideality of real gases, Joule - thomson effect, liquefaction of gases. The electrical field of a dipole can induce a dipole moment in adjacent molecule (which may be polar or non polar) then the induced dipole can interact electrostatically with the polarising dipole.

Q. Noble gases can be liquified due to " _____ " between atoms:

(A) ion-dipole interaction

(B) dipole-dipole interaction

(C) dipole-induced dipole interaction

(D) instantaneous dipole- induced dipole interaction

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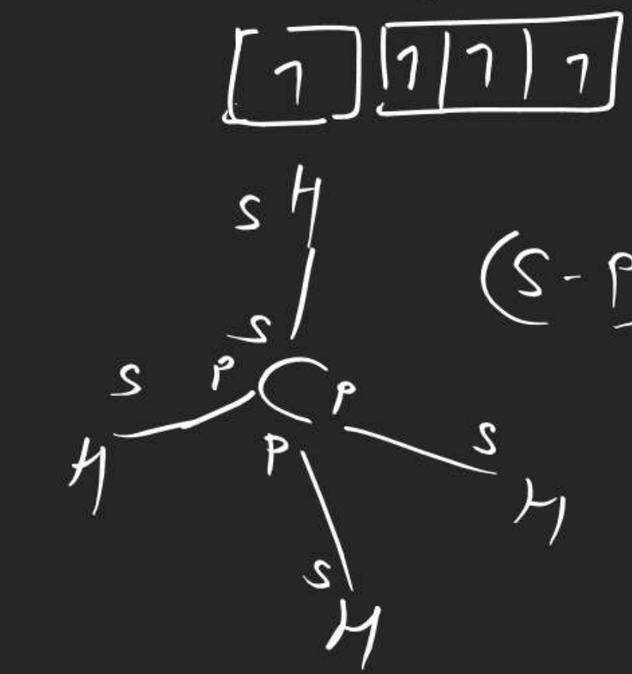
Bent's Rule

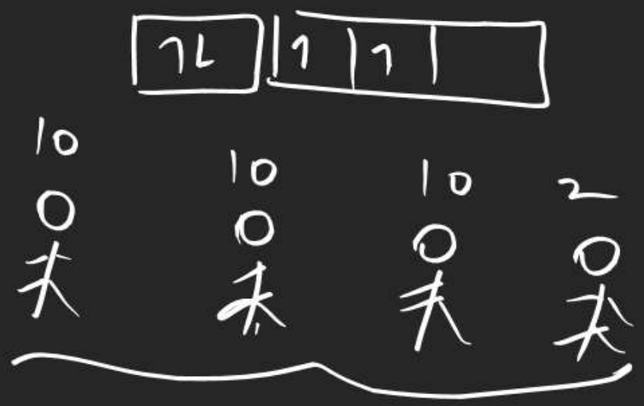
CH_4

$C = 1s^2 2s^2 2p^2$



(s-p) (s-s)

$C = 1s^2 2s^2 2p^2$



$(10 + 10 + 10 + 2)$

$\frac{32}{4} = 8$

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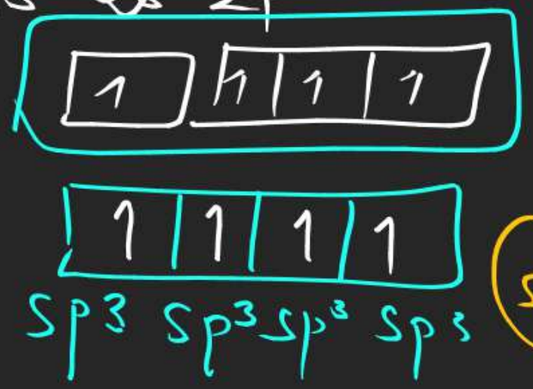
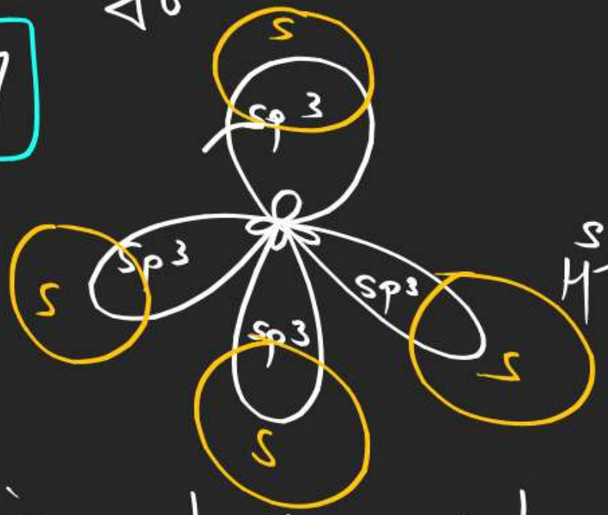
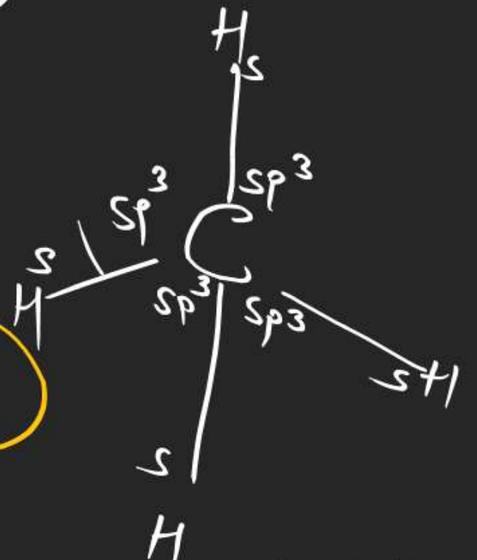
Hybridisation :→ Intermixing of atomic orbitals having less energy diff.

$C = 1s^2 2s^2 2p^2$







Note ⇒ first hybridisation followed by overlapping

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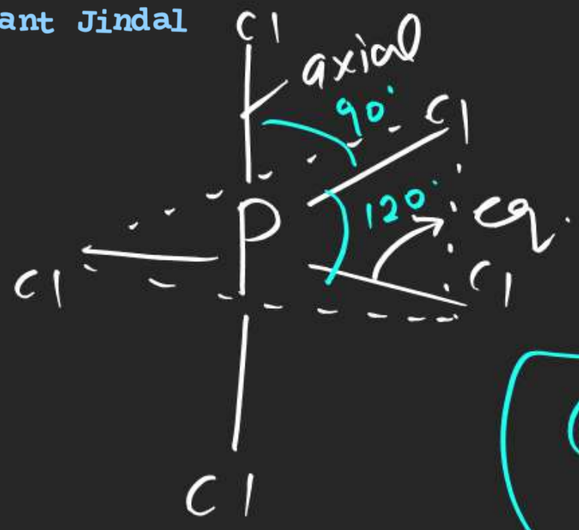
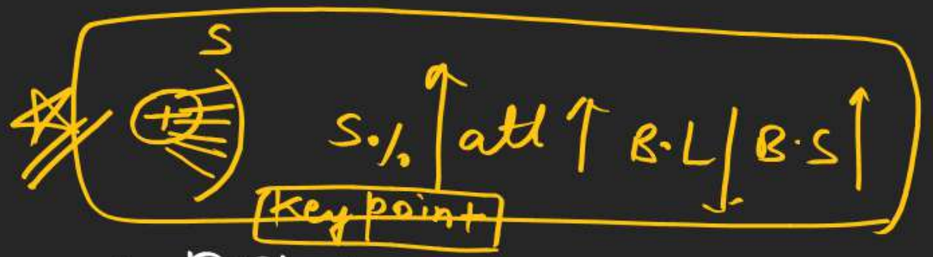
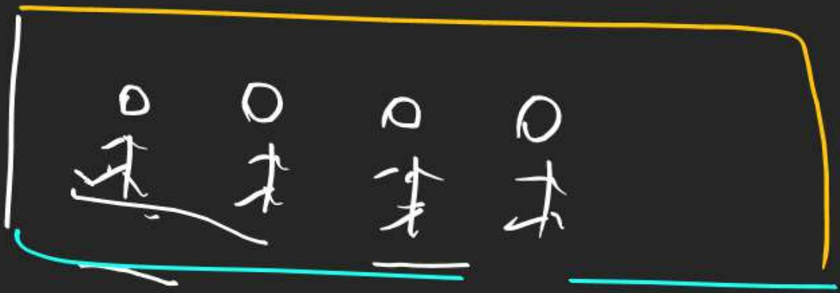


PCl_5 3p Cl, sp^3d, Cl, P, Cl, sp^3d 3p Cl

$\xrightarrow{\Delta}$ $PCl_3 + Cl_2$



$\cos\theta = \frac{S}{S-1}$ or $\frac{?}{?-1}$



axial

$\theta = 90°$

$\cos 90 = \frac{S}{S-1}$

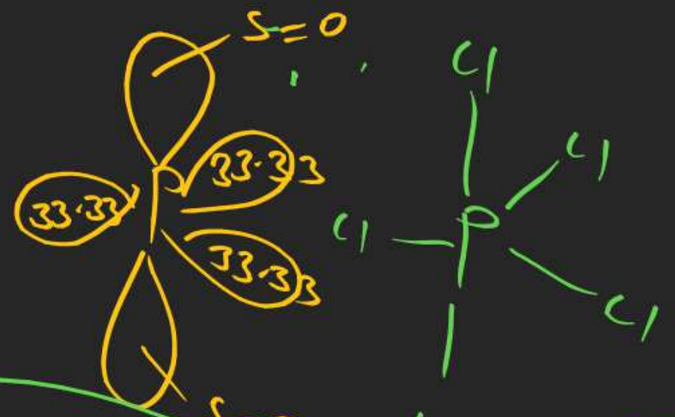
$S.\% = 0\%$

eq

$\theta = 120°$

$\cos 120° = \frac{S}{S-1}$

$S.\% = 33.33$



In PCl_5 axial P–Cl > eq. P–Cl B.L

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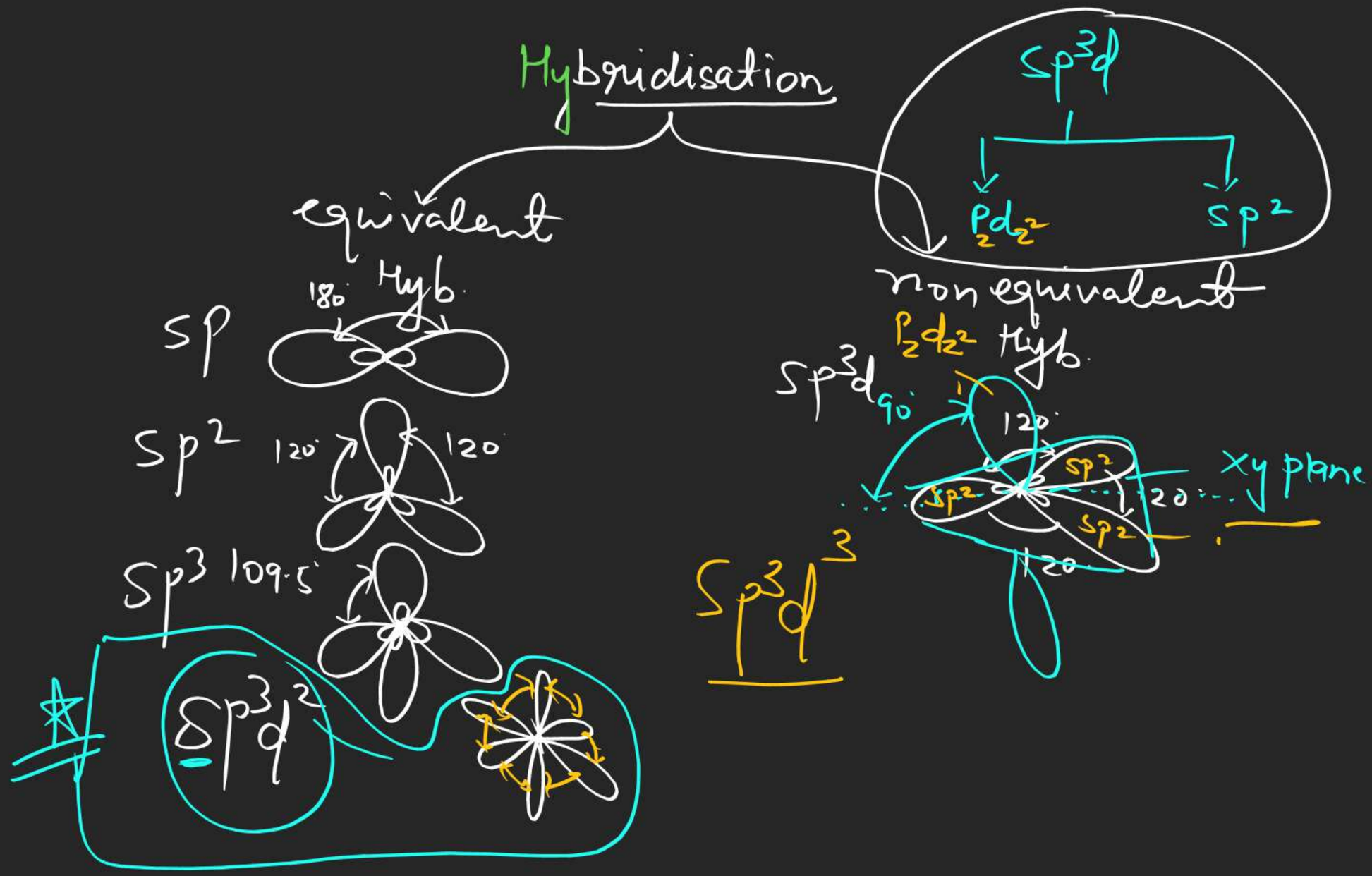
Hybridisation



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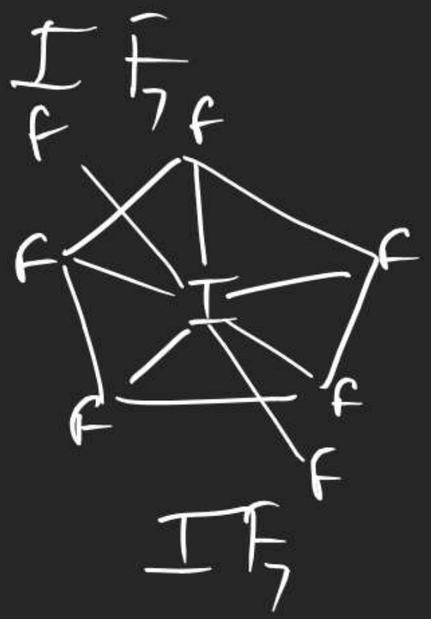

$\cos 90 = \frac{S}{S-1}$

$S/. = 0$

90°

72°

$\cos 72° = \frac{S}{S-1}$

$S/. = -ive$

sp^3d^3

Axial I-F B.L < eq I-F B.L