දුලාන් මධුරංග- රසායන විද්‍යාව විභාග මධ්‍යස්ථානය

Special Online Speed Test

අධ්‍යයන පොදු සහතික පත්‍ර (උසස් පෙළ), 2023 අගෝස්තු

General Certificate Of Education (Adv. Level) Examination, August 2023

රසායන විද්‍යාව I Chemistry I	02	S/E	I

Universal gas constant $R = 8.314\ J\ K^{-1}\ mol^{-1}$ Plank's constant $h = 6.626\times10^{-34}\ J\ s$

Avogadro constant $N_A = 6.022\times10^{23}\ mol^{-1}$ Velocity of light $c = 3\times10^{8}\ m\ s^{-1}$

Answer all the Questions. **Time – 20 Minutes**

1. Of the following what is the most acceptable Lewis structure of $OSCN^-$ (O – S – C – N)?

1) $\ddot{O} = \ddot{S} = C = \ddot{N}^{(-)}$ 2) $\ddot{O} = \ddot{S}^{(-)} - C \equiv N:$ 3) $^{(-)}:\ddot{O} - \ddot{S} - C \equiv N:$

4) $:\overset{(+)}{O} \equiv \ddot{S} - \overset{(-)}{C} = \ddot{N}^{(-)}$ 5) $\ddot{O} = \overset{(+)}{S} \equiv C - \ddot{N}:^{(2-)}$

2. In which of the following answers, do the shapes of all species derive from octahedral geometry?

1) XeF_2 , SF_6 , IF_4^- 2) XeF_4 , BrF_5 , $XeOF_4^-$ 3) SF_4^- , ICl_2^- , ICl_5

4) PCl_4^-, SF_6 , XeF_4 5) IF_3 , ClF_4^-, XeO_2F_2

3. Which of the following species contain /s 4 atoms in the same plane ?

a) BF_3 b) CH_4 c) NH_3 d) PBr_3

4. Shape of which of the following species is /are similar to that of SO_3^{2-} ion ?

a) BrO_3^- b) NO_3^- c) CO_3^{2-} d) NH_3

5. Ascending order of the bond angles of the following species.

A : ICl_2^- B : SO_2 C : PH_3 D : H_3O^+

1) D < C < B < A 2) C < D < B < A 3) D < B < C < A

4) C < D < A < B 5) A < B < C < D

6. Which of the following statement is correct.

1) SO_2 is linear and F_2O is angular.

2) ClF_3 is pyramidal and I_3^- is linear.

3) PCl_6^- is octahedral and ClO_3^- is sea – saw shaped.

4) ClO_3^- is T shaped and ClF_3 is pyramidal.

5) XeF_4 is square planar and XeO_4 is tetrahedral.

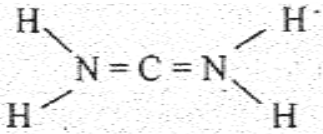
7. Which is correct regarding ClO_2^- ion ?

	Hybridization of Cl	Electron geometry around Cl	Shape of the ion	Bond angle
(1)	SP^3	trigonal planar	angular	$< 120^0$
(2)	SP	linear	linear	180^0
(3)	SP^3	tetrahedral	angular	$< 109^0$
(4)	SP^3	tetrahedral	trigonal planar	109^0
(5)	SP^2	trigonal planar	trigonal planar	120^0

8. $H-C\equiv \overset{2}{C}-\overset{1}{\overset{H}{C}}=O$ The hybridization of C_1 and C_2 respectively are,

(1) sp, sp^3 (2) sp, sp (3) sp, sp^2 (4) sp^2, sp (5) sp^2, sp^3

9.



True statement/s regarding the above structure is/are,

(a) N atoms are sp^2 hybridized.

(b) All atoms lie on one plane.

(c) Oxidation number of N is zero.

(d) C atom is sp hybridized.

10. Which of the following species has the highest number of lone pairs of electrons around its central atom?

(1) ClO_3^- (2) XeF_4 (3) I_3^- (4) SF_4 (5) NO_3^-

********** **Spot Test – 16 (Shapes Revision Exercise)** **********