C. $\uparrow\downarrow$ $\boxed{\uparrow\downarrow}\boxed{\uparrow}\boxed{\uparrow}$

D. $\uparrow\downarrow$ $\boxed{\uparrow}\boxed{\uparrow}\boxed{\uparrow}$

12. The electronic configuration of a cation M^{5+} is $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6$. What would be the electronic configuration for M?

 A. $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^1$

 B. $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^5$

 C. $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 3d^5$

 D. $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 3d^3\ 4s^2$

13. The molecule BF_3 is an example of a molecule that

 A. Obeys the octet rule

 B. has an expanded octet

 C. Has an incomplete octet

 D. has odd number of electrons

14. What is the type of hybridisation for the central atom of SO_3^{2-}?

 A. sp C. sp^3

 B. sp^2 D. sp^3d

15 Based on VSEPR theory, predict the shape of IBr_4^+ ion.

 A. Distorted tetrahedral

 B. Tetrahedral

 C. Trigonal pyramidal

 D. Square planar

16. The forces of attraction between hydrogen molecules are

 A. Covalent bond

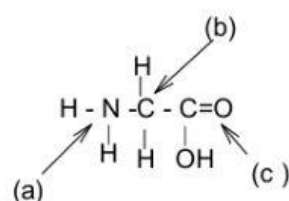 B. hydrogen bonds

 C. London forces

 D. dipole-dipole forces

17. Which of the following compound has the highest boiling point.

 A. CCl_4 C. CH_4

 B. CBr_4 D. CF_4

18. Which of the following species has the shortest nitrogen to nitrogen bond?

 A. N_2 C. N_2O

 B. N_2O_4 D. N_2H_4

19. What are the types of hybridization for a, b and c in the given molecule below?

 A. sp^2, sp^2, sp^3 C. sp, sp^2, sp^3

 B. sp, sp^3, sp^3d D. sp^3, sp^3, sp^2

20. A 3.0 L vessel is filled with 12.85 g of a gas mixture at 30^0C. The gas mixture consisted of 80% w/w of argon and 20% w/w of nitrogen gas.

 Calculate the total pressure of gasses

 A. 3.35 atm   C. 2.10 atm

 B. 2.89 atm   D. 3.89 atm

21. Calculate the total pressure exerted by a mixture of 16g of N_2 and 12 g of O_2 in a 3.0 L vessel at 25^0C.

 A. 8.2 atm C. 7.70 atm

 B. 6.70 atm   D. 7.25 atm

22. A 2 dm^3 glass vessel at T^0C contains Helium gas at 1/4P while a 3 dm^3 glass vessel at the same temperature contains oxygen at 1/2P. When both vessels are joined and the gases are completely mixed, what is the partial pressure of the oxygen gas?

 A. 3/10P   C. 3/20P

 B. 4/5P   D. 5/4P