

## NEET CHEMISTRY 2018-19 - Chennai

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Name: \_\_\_\_\_

Time: 3HRS

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**Negative Marks : 4 marks for correct attempt & 1 mark deducted for every wrong attempt.**

- The element  $z = 114$  has been discovered recently. It will belong to which of the following family/group and electronic configuration?
  - Carbon family,  $[\text{Rn}] 5f^{14} 6d^{10} 7s^2 7p^2$
  - Oxygen family,  $[\text{Rn}] 5f^{14} 6d^{10} 7s^2 7p^4$
  - Nitrogen family,  $[\text{Rn}] 5f^{14} 6d^{10} 7s^2 7p^6$
  - Halogen family,  $[\text{Rn}] 5f^{14} 6d^{10} 7s^2 7p^5$
- In which of the following options the order of arrangement does not agree with the variation of property indicated against it?
  - $\text{I} < \text{Br} < \text{Cl} < \text{F}$  (increasing electron gain enthalpy)
  - $\text{Li} < \text{Na} < \text{K} < \text{Rb}$  (increasing metallic radius)
  - $\text{Al}^{3+} < \text{Mg}^{2+} < \text{Na}^+ < \text{F}^-$  (increasing ionic size)
  - $\text{B} < \text{C} < \text{N} < \text{O}$  (increasing, first ionisation enthalpy)
- The species  $\text{Ar}, \text{K}^+$  and  $\text{Ca}^{2+}$  contain the same number of electrons. In which order do their radii increase?
  - $\text{Ca}^{2+} < \text{K}^+ < \text{Ar}$
  - $\text{K}^+ < \text{Ar} < \text{Ca}^{2+}$
  - $\text{Ar} < \text{K}^+ < \text{Ca}^{2+}$
  - $\text{Ca}^{2+} < \text{Ar} < \text{K}^+$
- Which of the following orders of ionic radii is correctly represented?
  - $\text{H}^- > \text{H}^+ > \text{H}$
  - $\text{Na}^+ > \text{F} > \text{O}^{2-}$
  - $\text{F} > \text{O}^{2-} > \text{Na}^+$
  - $\text{Al}^{3+} > \text{Mg}^{2+} > \text{N}^{3-}$
- Which one of the following arrangements represents the correct order of least negative to most negative electron gain enthalpy for C, Ca, Al, F and O
  - $\text{Al} < \text{Ca} < \text{O} < \text{C} < \text{F}$
  - $\text{Al} < \text{O} < \text{C} < \text{Ca} < \text{F}$
  - $\text{C} < \text{F} < \text{O} < \text{Al} < \text{Ca}$
  - $\text{Ca} < \text{Al} < \text{C} < \text{O} < \text{F}$
- Identify the wrong statement in the following
  - Amongst isoelectronic species, smaller the positive charge on the cation, smaller is the ionic radius.
  - Amongst isoelectronic species, greater the negative charge on the anion, larger is the ionic radius.
  - Atomic radius of the elements 'increases as one moves down the first group of the elements decreases periodic table.

- (d) Atomic radius of the elements decreases as one moves across from left to right in the 2<sup>nd</sup> period of the periodic table.
7. What is value of electron gain enthalpy? of Na<sup>+</sup> if IE<sub>1</sub> of Na = 5.1 eV?
- 5.1 eV
  - 10.2 eV
  - +2.55 eV
  - +10.12 eV
8. The correct order of the decreasing ionic radii among the following isoelectronic species is
- Ca<sup>2+</sup> > K<sup>+</sup> > S<sup>2-</sup> > Cl<sup>-</sup>
  - Cl<sup>-</sup> > S<sup>2-</sup> > Ca<sup>2+</sup> > K<sup>+</sup>
  - S<sup>2-</sup> > Cl<sup>-</sup> > K<sup>+</sup> > Ca<sup>2+</sup>
  - K<sup>+</sup> > Ca<sup>2+</sup> > Cl<sup>-</sup> > S<sup>2-</sup>
9. Which of the following represents the correct order of increasing electron gain enthalpy with negative sign for the elements O, S, F and Cl
- Cl < F < O < S
  - O < S < F < Cl
  - F < S < O < Cl
  - S < O < Cl < F
10. Among the elements Ca, Mg, P and Cl the order of increasing atomic radii is
- Mg < Ca < Cl < P
  - Cl < P < Mg < Ca
  - P < Cl < Ca < Mg
  - Ca < Mg < P < Cl
11. Among the following which one has the highest cation to anion size ratio?
- CsI
  - (h) CsF
  - Lid
  - NaF
12. Amongst the elements with following electronic configurations, which one of them may have the highest ionisation energy?
- Ne [3s<sup>2</sup> 3p<sup>2</sup>]
  - Ar [3d<sup>10</sup> 4s<sup>2</sup> 4p<sup>3</sup>]
  - Ne [3s<sup>2</sup> 3p<sup>1</sup>]
  - Ne [3s<sup>2</sup> 3p<sup>3</sup>]
13. Which one of the following arrangements does not give the correct picture of the trends indicated against it?
- F<sub>2</sub> > Cl<sub>2</sub> > Br<sub>2</sub> > I<sub>2</sub> : Bond dissociation energy
  - F<sub>2</sub> > Cl<sub>2</sub> > Br<sub>2</sub> > I<sub>2</sub> : Electro negativity
  - F<sub>2</sub> > Cl<sub>2</sub> > Br<sub>2</sub> > I<sub>2</sub> : Oxidizing power
  - F<sub>2</sub> > Cl<sub>2</sub> > Br<sub>2</sub> > I<sub>2</sub> : Electron gain enthalpy
14. Identify the correct order of the size of the following:
- Ca<sup>2+</sup> < K<sup>+</sup> < Ar < Cl<sup>-</sup> < S<sup>2-</sup>
  - Ar < Ca<sup>2+</sup> < K<sup>+</sup> < Cl<sup>-</sup> < S<sup>2-</sup>
  - Ca<sup>-</sup> < Ar < K<sup>+</sup> < Cl<sup>-</sup> < S<sup>2-</sup>
  - Ca<sup>2+</sup> < K<sup>+</sup> < Ar < S<sup>2-</sup> < Cl<sup>-</sup>

15. With which of the following electronic configuration an atom\_ has the lowest ionization enthalpy
- $1s^2 2s^2 2p^3$
  - $1s^2 2s^2 2p^5 3s^1$
  - $1s^2 2s^2 2p^6$
  - $1s^2 2s^2 2p^5$
16. Which one of the following ionic species has the greatest proton affinity to form a stable compound?
- $NH_2^-$
  - $F^-$
  - $I^-$
  - $HS^-$
17. Which one of the following orders is not in accordance with the property stated against it?
- $F_2 > Cl_2 > Br_2 > I_2$  : Bond dissociation energy
  - $F_2 > Cl_2 > Br_2 > I_2$ : Oxidizing power
  - $HI > HBr > HCl > HF$ : Acidic property in water
  - $F_2 > Cl_2 > Br_2 > I_2$ : Electro negativity
18. Which one of the following arrangements represents the correct order of electron gain enthalpy (with negative sign) of the given atomic species?
- $S < O < Cl < F$
  - $Cl < F < S < O$
  - $F < Cl < O < S$
  - $O < S < F < Cl$
19. Ionic radii are
- Inversely proportional to effective nuclear charge
  - Inversely Proportional to square of effective nuclear charge
  - Directly proportional to effective nuclear charge
  - Directly proportional to square of effective nuclear charge
20. The ions  $O^{2-}$ ,  $F^-$ ,  $Na^+$ ,  $Mg^{2+}$  and  $Al^{3+}$  are isoelectronic. Their ionic radii show
- a significant increase from  $O^{2-}$  to  $Al^{3+}$
  - a significant decrease from  $O^{2-}$  to  $Al^{3+}$
  - an increase from  $O^{2-}$  to  $F^-$  and then decrease from  $Na^+$  to  $Al^{3+}$
  - a decrease from  $O^{2-}$  to  $F^-$  and then increase from  $Na^+$  to  $Al^{3+}$
21. Which statement is wrong?
- Bond energy of  $F_2 > Cl_2$
  - Electronegativity  $F > Cl$
  - $F$  is more oxidising than  $Cl$
  - Electron affinity of  $Cl > F$
22. Which of the following elements has the maximum electron affinity?
- $1$
  - $Br$
  - $Cl$
  - $F$

23. The first ionization potentials (eV) of Be and B respectively are
- 8.29, 8.29
  - 9.32, 9.32
  - 8.29, 9.32
  - 9.32, 8.29
24. Which one of the following is correct order of the size of iodine species?
- $I^+ > I^- > I$
  - $I^- > I > I^+$
  - $I > I^- > I^+$
  - $I > I^+ > I^-$
25. Which of the following ion is the largest in size?
- K
  - $Ca^{2+}$
  - $Cl^-$
  - $S^{2-}$
26. Which of the following has the smallest size?
- $Al^{3+}$
  - F
  - $Na^+$
  - $Mg^{2+}$
27. The electronic configuration of an element is  $1s^2 2s^2 3s^2 2p^6 3s^2 3p^3$ . What is the atomic number of the element, which is just below the above element in the periodic table?
- 33
  - 34
  - 36
  - 49
28. One would expect proton to have very
- large charge
  - ionization potential
  - hydration energy
  - radius
29.  $Na^+$ ,  $Mg^{2+}$ ,  $Al^{3+}$  and  $Si^{4+}$  are isoelectronic the order of their ionic size is
- $Na^+ > Mg^{2+} > Al^{3+} < Si^{4+}$
  - $Na^+ < Mg^{2+} > Al^{3+} > Si^{4+}$
  - $Na^+ > Mg^{2+} > Al^{3+} > Si^{4+}$
  - $Na^+ < Mg^{2+} > Al^{3+} < Si^{4+}$
30. If the atomic number of an element is 33, it will be placed in the periodic table in the
- first group
  - third group
  - fifth group
  - Seventh group.
31. In the periodic table from left to right in a period, the atomic volume
- decreases
  - increases
  - remains same
  - first decrease then increases.
32. Which electronic configuration of an element has abnormally high difference between second and third ionization.
- $1s^2, 2s^2, 2p^6, 3s^1$
  - $1s^2, 2s^2, 2p^6, 3s^1 3p^1$
  - $1s^2, 2s^2, 2p^6, 3s^2 3p^2$
  - $1s^2, 2s^2, 2p^6, 3s^2$

33. One of the characteristic properties of non-metals is that they
- are reducing agents
  - form basic oxides
  - form cations by electron gain
  - are electronegative.
34. Pauling's electronegativity values for elements are useful in predicting
- polarity of the molecules
  - position in the EMF series.
  - coordination numbers
  - dipole moments,
35. The electronic configuration of four elements are given below. Which element does not belong to the same family as others?
- $[\text{Xe}]4f^{14} 5d^{10} 1s^2$
  - $[\text{Kr}]4d^{10} 5s^2$
  - $[\text{Ne}]3s^2 3p^5$
  - $[\text{Ar}]3d^{10} 4s^2$
36. In the periodic table, with the increase in atomic-number, the metallic character of an element
- decreases in a period and increases in a group
  - increases in a period and decreases in a group
  - increases both in a period and the group
  - decreases in a period and the group.
37. Which of the following pairs of compounds is isoelectronic and isostructural?
- $\text{TeI}_2$ ,  $\text{XeF}_2$
  - $\text{IBr}_2$ ,  $\text{XeF}_2$
  - $\text{IF}_3$ ,  $\text{XeF}_2$ ,
  - $\text{BeCl}_2$ ,  $\text{XeF}_2$
38. The species, having bond angles of  $120^\circ$  is
- $\text{ClF}_3$
  - $\text{NCI}_3$
  - $\text{BCl}_3$
  - $\text{PH}_3$
39. Which one of the following pairs of species have the same bond order?
- $\text{O}_2$ ,  $\text{NO}^+$
  - $\text{CN}^-$ ,  $\text{CO}$
  - $\text{N}_2$ ,  $\text{O}_2^-$
  - $\text{CO}$ ,  $\text{NO}$
40. Which one of the following compounds shows the presence of intramolecular hydrogen bond?
- $\text{H}_2\text{O}_2$
  - $\text{HCN}$
  - Cellulose
  - Concentrated acetic acid
41. The hybridizations of atomic orbitals of nitrogen in  $\text{NO}_2^+$ ,  $\text{NO}_3^-$  and  $\text{NH}_4^+$  respectively are
- $sp$ ,  $sp^3$  and  $sp^2$
  - $sp^2$ ,  $sp^3$  and  $sp$
  - $sp$ ,  $sp^2$  and  $sp^3$
  - $sp^2$ ,  $sp$  and  $sp^3$

42. Which of the following pairs of ions is isoelectronic and isostructural?
- $\text{CO}_3^{2-}$ ,  $\text{NO}_3^-$
  - $\text{ClO}_3^-$ ,  $\text{CO}_3^{2-}$
  - $\text{SO}_3^{2-}$ ,  $\text{NO}_3^-$
  - $\text{ClO}_3^-$ ,  $\text{SO}_3^{2-}$
43. The correct geometry and hybridization for  $\text{XeF}_4$  are
- octahedral,  $\text{sp}^3\text{d}^2$
  - trigonal bipyramidal,  $\text{sp}^3\text{d}$
  - planar triangle,  $\text{sp}^3\text{d}^3$
  - square planar,  $\text{sp}^3\text{d}^2$
44. Among the following which one is a wrong statement?
- $\text{PH}_5$  and  $\text{BiCl}_5$  do not exist.
  - $\text{p}\pi\text{-d}\pi$  in bonds are present in  $\text{SO}_2$ .
  - $\text{SeF}_4$  and  $\text{CH}_4$  have same shape
  - $\text{I}_3^+$  has bent geometry
45. Consider the molecules  $\text{CH}_4$ ,  $\text{NH}_3$  and  $\text{H}_2\text{O}$ . Which of the given statement is false?
- The H-O-H bond angle in  $\text{H}_2\text{O}$  is smaller than H-N-H bond angle in  $\text{NH}_3$
  - The H-C-H bond angle in  $\text{CH}_4$  is larger than H-N-H bond angle in  $\text{NH}_3$
  - The H-C-H bond angle in  $\text{CH}_4$  the H-N-H bond angle in  $\text{NH}_3$  and the H-O-H bond angle in  $\text{H}_2\text{O}$  are all greater than  $90^\circ$
  - The H-O-H bond angle in  $\text{H}_2\text{O}$  is larger than the H-C-H bond angle in  $\text{CH}_4$
46. Predict the correct order among the following
- bond pair - bond pair > lone pair - bond pair > lone pair - lone pair
  - Lone pair - bond pair > bond pair - bond pair > lone pair - lone pair
  - lone pair - lone pair > lone pair - bond pair > bond pair - bond pair
  - lone pair - lone pair > bond pair - bond pair > lone pair - bond pair
47. In which of the following pairs, both the species are not isostructural?
- Diamond, Silicon carbide
  - $\text{NH}_3$ ,  $\text{PH}_3$
  - $\text{XeF}_4$ ,  $\text{XeO}_4$
  - $\text{SiCl}_4$ ,  $\text{PCl}_4$
48. Decreasing order of stability of  $\text{O}_2^-$ ,  $\text{O}_2^+$  and  $\text{O}_2^{2-}$  is
- $\text{O}_2^{2-} > \text{O}_2^+ > \text{O}_2 > \text{O}_2^-$
  - $\text{O}_2 > \text{O}_2^+ > \text{O}_2^{2-} > \text{O}_2^-$
  - $\text{O}_2^- > \text{O}_2^{2-} > \text{O}_2^+ > \text{O}_2$
  - $\text{O}_2^+ > \text{O}_2 > \text{O}_2^- > \text{O}_2^{2-}$
49. Which Of the following pairs of ions are isoelectronic and isostructural?
- $\text{SO}_3^{2-}$ ,  $\text{NO}_3^-$
  - $\text{ClO}_3^-$ ,  $\text{SO}_3^{2-}$
  - $\text{CO}_3^{2-}$ ,  $\text{SO}_3^{2-}$
  - $\text{ClO}_3^-$ ,  $\text{CO}_3^{2-}$
50. The correct bond order in the following species is
- $\text{O}_2^+ < \text{O}_2^- < \text{O}_2^{2+}$
  - $\text{O}_2^- < \text{O}_2^+ < \text{O}_2^{2+}$
  - $\text{O}_2^{2+} < \text{O}_2^+ < \text{O}_2^-$
  - $\text{O}_2^{2+} < \text{O}_2^- < \text{O}_2^+$