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SET 2 – Periodic Properties and Their Trends

1. Atomic radius is defined as –
   a) Half the distance between the nuclei of two bonded atoms
   b) The distance between nucleus and outermost shell
   c) The size of an atom in crystal
   d) None of these

2. Atomic radius decreases across a period due to –
   a) Increase in nuclear charge
   b) Increase in electron number
   c) Increase in principal quantum number
   d) Screening effect

3. Atomic radius increases down a group because –
   a) New shells are added
   b) Nuclear charge decreases
   c) Electronegativity increases
   d) None of these

4. In the periodic table, the smallest atom is –
   a) Helium b) Hydrogen c) Fluorine d) Neon

5. In the periodic table, the largest atom is –
   a) Francium b) Cesium c) Lithium d) Sodium

6. Which of the following has the smallest atomic radius?
   a) F b) O c) N d) C

7. Which of the following has the largest atomic radius?
   a) Li b) Na c) K d) Cs

8. The atomic radius of Na is larger than that of Mg because –
   a) Na has smaller nuclear charge
   b) Na has more protons
   c) Na has more neutrons
   d) Na is more electronegative

9. Ionic radius of a cation is –
   a) Smaller than its parent atom
   b) Larger than its parent atom
   c) Equal to its parent atom
   d) Same as anion

10. Ionic radius of an anion is –
    a) Larger than its parent atom

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b) Smaller than its parent atom
c) Equal to parent atom
d) None of these

11. Which has the largest ionic radius?
a) F^- b) O^{2-} c) Na^+ d) Mg^{2+}

12. Which of the following has the smallest ionic radius?
a) Mg^{2+} b) Al^{3+} c) Na^+ d) F^-

13. Isoelectronic species have –
a) Same number of electrons
b) Same number of protons
c) Same number of neutrons
d) None

14. Which of the following are isoelectronic?
a) Na^+ and F^- b) Na and F c) Na^+ and O^{2-} d) O^{2-} and F^-

15. Ionization enthalpy is defined as –
a) Energy required to remove an electron from an isolated gaseous atom
b) Energy released when an electron is added
c) Energy released when ion combines
d) None

16. Ionization enthalpy generally –
a) Increases across a period
b) Decreases across a period
c) Constant across a period
d) None

17. Ionization enthalpy –
a) Decreases down a group
b) Increases down a group
c) Remains same
d) None

18. Which element has the highest ionization enthalpy?
a) Helium b) Hydrogen c) Neon d) Fluorine

19. Which element has the lowest ionization enthalpy?
a) Cesium b) Francium c) Lithium d) Sodium

20. Second ionization enthalpy is always –
a) Greater than the first
b) Smaller than the first
c) Equal to the first

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d) None

21. The element with the lowest ionization enthalpy in period 2 is –
a) Lithium b) Beryllium c) Boron d) Carbon

22. The element with the highest ionization enthalpy in period 2 is –
a) Neon b) Fluorine c) Oxygen d) Nitrogen

23. Electron gain enthalpy is the energy –
a) Released when an electron is added to a neutral gaseous atom
b) Required to remove an electron
c) Released when atom ionizes
d) None

24. Electron gain enthalpy is most negative for –
a) Chlorine b) Fluorine c) Oxygen d) Neon

25. Electron gain enthalpy becomes less negative down a group because –
a) Size increases
b) Nuclear charge decreases
c) Electronegativity decreases
d) None

26. Which element has the least negative electron gain enthalpy?
a) Fluorine b) Chlorine c) Iodine d) Oxygen

27. Electron gain enthalpy is positive for –
a) Noble gases b) Halogens c) Alkali metals d) Alkaline earth metals

28. Electronegativity is the tendency of an atom to –
a) Attract shared pair of electrons
b) Lose electrons
c) Gain protons
d) Share all electrons

29. Electronegativity generally –
a) Increases across a period
b) Decreases across a period
c) Remains constant
d) None

30. Electronegativity –
a) Decreases down a group
b) Increases down a group
c) Remains constant
d) None

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31. Which element has the highest electronegativity?
    a) Fluorine b) Oxygen c) Nitrogen d) Chlorine

32. Which element has the lowest electronegativity?
    a) Cesium b) Francium c) Sodium d) Lithium

33. The most metallic element in period 3 is –
    a) Sodium b) Aluminum c) Magnesium d) Silicon

34. The most non-metallic element in period 3 is –
    a) Chlorine b) Sulphur c) Phosphorus d) Argon

35. Metallic character increases –
    a) Down a group b) Across a period c) Both d) None

36. Non-metallic character increases –
    a) Across a period b) Down a group c) Both d) None

37. Valency depends upon –
    a) Number of valence electrons
    b) Number of shells
    c) Number of neutrons
    d) Atomic mass

38. Elements of group 1 have valency –
    a) 1 b) 2 c) 3 d) 4

39. Elements of group 2 have valency –
    a) 2 b) 1 c) 3 d) 4

40. Elements of group 13 have valency –
    a) 3 b) 1 c) 2 d) 4

41. Elements of group 14 have valency –
    a) 4 b) 2 c) 1 d) 3

42. Elements of group 15 have valency –
    a) 3 b) 4 c) 2 d) 1

43. Elements of group 16 have valency –
    a) 2 b) 1 c) 3 d) 4

44. Elements of group 17 have valency –
    a) 1 b) 2 c) 3 d) 4

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45. Elements of group 18 have valency –
    a) 0 b) 1 c) 2 d) 3

46. Atomic radius and ionization enthalpy are related as –
    a) Inversely proportional b) Directly proportional c) Independent d) None

47. Electronegativity and metallic character are related as –
    a) Inversely proportional b) Directly proportional c) Equal d) None

48. Ionization enthalpy and electron affinity generally –
    a) Increase across a period
    b) Decrease across a period
    c) Decrease down a period
    d) None

49. Which of the following has zero electron gain enthalpy?
    a) Neon b) Oxygen c) Nitrogen d) Sulphur

50. Which of the following has the highest electron affinity?
    a) Chlorine b) Fluorine c) Oxygen d) Nitrogen

✅ Answer Key – Set 2

1–a 2–a 3–a 4–a 5–a 6–a 7–d 8–a 9–a 10–a
11–b 12–b 13–a 14–a 15–a 16–a 17–a 18–a 19–b 20–a
21–a 22–a 23–a 24–a 25–a 26–c 27–a 28–a 29–a 30–a
31–a 32–b 33–a 34–a 35–a 36–a 37–a 38–a 39–a 40–a
41–a 42–a 43–a 44–a 45–a 46–a 47–a 48–a 49–a 50–a