Atomic number, Mass number, Atomic species

49. (c) In Xe_{89}^{231} number of protons and electrons is 89 and No. of neutrons = $A - Z$ = 231 – 89 = 142.

50. (c) **Li^+** → Li has atomic number 3 → Li^+ has 3 – 1 = 2 electrons same as Be^{2+}.

51. (a) NO_2^- and O_3 are isostere. The number of atoms in these $(= 3)$ and number of electrons (24) are same.

52. (c) Number of electrons in nitrogen = 7 and number of electron is oxygen = 8 we know that formula of nitrate ion is NO_3^- we also know that number of electron

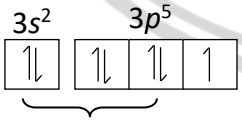
= (1 × Number of electrons in nitrogen) + (3 × number of electrons in oxygen) + 1

= (1 × 7) + (3 × 8) + 1 = 32.

53. (b) Atomicity = $\frac{\text{Molecular mass}}{\text{Atomic mass}} = \frac{256}{32} = 8 = S_8$.

54. (a) In case of N^{3-}, $p = 7$ and $c = 10$

55. (c) Chlorine $Cl_{17} = [Ne]$



Three electron

56. (a) Bromine consists of outer most electronic configuration $[Ar]3d^{10}4s^24p^5$.

57. (d) $Na^+ = 1s^22s^22p^6$

$Mg^{++} = 1s^22s^22p^6$

$O^{2-} = 1s^2 2s^2 2p^6$

$Cl^- = 1s^2 2s^2 2p^6 3s^2 3p^6$

58. **Step 1 – Atomic number of Li:**
Lithium (Li) has atomic number = 3 → 3 protons, 3 electrons (neutral).

Step 2 – Li^+ ion:
Li^+ means it has lost 1 electron → protons (3) > electrons (2).

So, net charge = +1 (because of one extra proton compared to electrons).

Step 3 – Value of charge:
Charge of 1 elementary unit = 1.6×10^{-19} C.
Hence, Li^+ has charge = **$+1.6 \times 10^{-19}$ C**.

Correct answer: (c) 1.6×10^{-19} C

59. Correct answer: (a) F^- , O^{2-}

F^- → Atomic number of F = 9, +1 electron → 9 + 1 = **10 electrons**

O^{2-} → Atomic number of O = 8, +2 electrons → 8 + 2 = **10 electrons**

60. (a) Ar_{18}^{40} = atomic number 18 and no. of Neutron in case of Ar_{22}
Neutron = Atomic mass – Atomic number
$= 40 - 18 = 22$

61. (d) Nucleus of tritium contain $[H_1^3]$
$p = 1, e = 1, n = 2$

62. (b) N^{3-}, F^- and Na^+ (These three ions have $e^- = 10$, hence they are isoelectronic)

63. (a) NO_3^- and CO_3^{2-} consist of same electron and show same isostructural.

64. (c) Atomic number of chlorine 17 and in Cl^- ion total no. of electron =18.

65. (b) Tritium (H_1^3) has one proton and two neutron.

67. (c) $X_{35} = 1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4s^2 4p^5$

Total no. of e^- is all *p*–orbitals $= 6 + 6 + 5 = 17$.

68. (a) Since its nucleus contain 9 proton so its. atomic number is 9 and its electronic configuration is 2, 7. So it require one more electron to complete its octet. Hence its valency is 1.

69. (d) K_2S formed by $K^+$and S^{2-} ion. We know that atomic number of *K* is 19 and in K^+ion its atomic number would be 18 similarly atomic number of *S* is 16 and in form S^{2-} ion its atomic number would be 18 so the $K^+$and $S^{2-}$are isoelectronic with each other in K_2S.

70. (d) $20Ca = 2,8,8,2$

$Ca^{2+} = 2, 8, 8$

Hence, Ca^{2+} has 8 electrons each in outermost and penultimate shell.

71. (c) Atomic no. of *C* = 6 so the number of protons in the nucleus = 6

72. (a) No. of $P = Z = 7$; No. of electrons in $N^{3-} = 7 + 3 = 10$.

73. (b) Heavy hydrogen is ^2_1D.Number of neutrons = 1

74. (d) Atomic number is always whole number.