Atomic number, Mass number, Atomic species

25. (b) $-CONH_2 = 6 + 8 + 7 + 2 + 1$ (from other atom to form covalent bond) = 24.

26. (b) Complete $E.C. = [Ar]^{18}3d^{10}4s^2 4p^6$.
Hence no. of e^- = no. of protons = $36 = Z$.

28. (a) $K^+ = 1s^2 2s^2 2p^6 3s^2 3p^6$
$Cl^- = 1s^2 2s^2 2p^6 3s^2 3p^6$.

29. (c) Mass no. ≈ At. Wt.
Mass no. = no. of protons + no. of neutrons
At. no. = no. of protons.

30. (b) $N_2O = 14 + 8 = 22$
$CO_2 = 6 + 16 = 22$.

31. (c) Neutron in $^{12}_{6}C = 6$, , Neutrons in $^{28}_{14}Si = 14$
Ratio = 6 : 14 = 3 : 7.

33. (d) $N_7 = 1s^2 2s^2 2p^3$
$N^+ = 1s^2 2s^2 2p^2$
$C = 1s^2 2s^2 2p^2$.

34. (c) $O = C = O$, linear structure 180^o angle
$Cl - Hg - Cl$, linear structure 180^o angle.

35. (c) $H^- = 1s^2$ and $\boldsymbol{He^+ = 1s^2}$.

36. (c) In the nucleus of an atom only proton and neutrons are present.

37. (c) Cu^{63}_{29} Number of neutrons = atomic mass – atomic number = 63 – 29 = 34.

38. (b) 21 Protons and 24 Neutrons are present in nucleus and element is *Sc*.

40. (c) $_{7}X^{14}, n = 14 - 7 = 7$

42. (c) Cl^- have 17 proton, 18 neutron and 18 electron.

43. (a) Number of unpaired electrons in inert gas is zero because they have full filled orbitals.

44. (c) Electrons and Protons are same in neutral atom.

45. **(c) More neutrons minimize the coulomb repulsion**

Explanation:
As the number of protons (Z) in a nucleus increases, the electrostatic (Coulomb) repulsion between the positively charged protons also increases. Neutrons, which are electrically neutral, contribute to the attractive strong nuclear force that helps bind nucleons together without adding to the Coulomb repulsion. Therefore, heavier stable nuclei require a higher neutron-to-proton ratio (N/Z) to provide additional nuclear binding and help offset proton–proton repulsion. Options (a) and (b) are either irrelevant or insufficient as reasons, and (d) is incorrect because neutrons generally increase binding (they contribute to stability) rather than decrease it.

46. **(c) Tl^+**

Explanation:
Isoelectronic species have the same number of electrons. O^{-2} has 8 (atomic number of O) + 2 extra = 10 electrons.
- N^{-3}: Nitrogen has atomic number 7 → 7 + 3 = 10 electrons → isoelectronic.
- F^-: Fluorine has atomic number 9 → 9 + 1 = 10 electrons → isoelectronic.
- Na^+ Sodium has atomic number 11 → 11 - 1 = 10 electrons → isoelectronic.

- Tl^{+}: Thallium has atomic number 81 → 81 - 1 = 80 electrons → not isoelectronic with O^{-2}

47. **(b) 20**

Explanation:
Potassium (K) has atomic number 19, which means a neutral K atom has 19 electrons. The notation K^{-} indicates the ion carries a -1 charge (one extra electron). So the number of electrons = 19 + 1 = 20.
The superscript 40 is the mass number (protons + neutrons) and does not affect the electron count directly.

48. (d) No. of proton and no. of electron = 18$[Ar_{18}^{36}]$ and No. of neutron = 20
Mass number = $P + N = 18 + 20 = 38$.