True / False

Sol-1 Mass number is equal to the number of nucleons (protons + neutrons) in an atom

Sol-2 Cathode Rays defted in the presence of ~~magnetic~~ electric field.

Sol-3 Low pressure and high voltage should be maintained in the discharge tube for the production of cathode rays.

Sol-4 α-rays scattering experiment proved the presence of nucleus in an atom.

Sol-5 According to thomson's atomic model, an atom is a sphere of positive charge inside which negatively charged electrons are embedded.

Sol-6 The (e/m) ratio is same for different gases.

Sol-7 Bohr couldn't explain the stability of atom.

Level-1

Sol-21

Sol-22

Sol-23 No. of protons = Atomic number
= 17

No. of electrons = No. of protons
= 17

No. of neutrons = Mass no. - No. of protons
= 35 - 17 = 18

Sol-24 The atomic number of silicon is 14
Therefore, electronic configuration is : 2, 8, 4

Sol-25 Alpha particles are represented as $_2^4He$
Therefore, it consists of two ~~protons~~ protons and two neutrons (4-2).

Sol-26

Sol-27 Hydrogen is represented as $_1^1H$ having same mass no. as well as atomic no.

Sol-29

Sol-30 $_8X^{16}$ and $_8X^{17}$ are having same atomic no. but different mass no. So they are known as ~~isobars~~ isotopes.

Sol-31 The maximum no. of electrons in any shell $= 2n^2$ (n = shell no.)
For K-shell, $n = 1$
So, maximum no. of electrons $= 2(1)^2$
$= 2$

Sol-32

Sol-33 Ne, Na^+ and F^- contains same no. of electrons i.e. 10

Level-2

Sol-1 No. of neutrons in ~~$^{35}_{17}Cl$~~ $^{35}_{17}Cl^-$ = Mass no. − Atomic no.
= 35 − 17
= 18

Sol-2 Hydrogen is the only atom which doesn't contain any neutron.

Sol-3 ~~$^{y}_{x}A$~~ No. of neutrons in $^{y}_{x}A$ = $y - x$

No. of neutrons in $^{y+1}_{x}A$ = $y + 1 - x$

∴ Diff. in neutrons = $y + 1 - x - (y - x)$
= $y + 1 - x - y + x$
= 1

Sol-5 The atomic no. of potassium is 19.

Sol-6 Therefore, the electronic configuration is:

K	L	M	N
2	8	8	1

So, the 19th electron will occupy N-shell.

Sol-7 K^+ ion is formed by removing one electron from potassium atom. So it contains ~~(19−1)~~ 18 (19−1) electrons

Sol-8

	K	⟶	K^+	$+ e^-$
	2,8,8,1		2,8,8	
No. of electrons	19		18	

Sol-9 The element is represented as $^{19}_{9}M$

So, its electronic configuration is :

M : 2, 7

Therefore, to attain the octet, it ~~can~~ accepts one electron forming an anion, M^-.

Sol-10 The maximum no. of electrons in any shell $= 2n^2$ (n = shell no.)

for N-shell, ~~the value~~ $n = 4$

Maximum no. of electrons in N-shell $= 2(4)^2$

$= 32$

Sol-11 ~~The hydride ion contains 2 electrons~~

No. of electrons in hydride ion = 2 = No. of electrons in He atom

Sol-12 Protons + Neutrons = Nucleons

Sol-13 No. of protons = Atomic no.

$= 89$

No. of electrons = No. of protons

$= 89$

No. of neutrons = Mass no. − Atomic no.

$= 231 - 89$

$= 142$

Sol-14 No. of neutrons in $^{13}_{6}C = 13 - 6 = 7$

No. of neutrons in $^{12}_{6}C = 12 - 6 = 6$

Sol-15 $_{9}^{19}A$ and $_{7}^{21}B$ contains same no. of protons or have same atomic no. and different mass no. or different no. of neutrons. Therefore, they are belong to same element and hence are called isotopes.

Sol-16

Sol-17 No. of neutrons = Mass no. − Atomic no.
= 56 − 26
= 30

Sol-18

Sol-19 The atomic no. of sulphur is 16
So, the electronic configuration is : 2, 8, 6

Sol-20

Sol-21 No. of neutrons = Mass no. − Atomic no.
= 60 − 24
= 36

Sol-22

Sol-23 A molecule of phosphorus is represented as P_4
So it contains 4 atoms.

Sol-24 $_{6}A^{14}$, $_{6}A^{15}$ → ~~Isotopes~~ $_{6}A^{14}$, $_{6}A^{15}$, $_{6}E^{11}$ → Isotopes

$_{6}A^{14}$, $_{6}C^{15}$, $_{6}E^{11}$ → Isotopes

$_{6}A^{14}$, $_{7}B^{14}$ → Isobars

Sol-25 No. of neutrons in $^{40}_{19}K^{+}$ = 40 − 19
= 21

Sol-26 Hydrogen is represented as $^{1}_{1}H$

No. of protons = Atomic no.
= 1

No. of neutrons = Mass no. − Atomic no.
= 1 − 1
= 0

Subjective

Sol-1 Radicals are the neutral species having unpaired electron and ions are charged species.

Sol-2 Valency = No. of H-atoms

Sol-3 Valency of N = 3 (No. of H-atoms)

Sol-4

Sol-5 C O → CO_2

Sol-6 i) $3Fe + 4H_2O \rightarrow Fe_3O_4 + 4H_2$

ii) $N_2 + 3H_2 \rightarrow 2NH_3$

iii) $H_2SO_4 + 2NaOH \rightarrow Na_2SO_4 + 2H_2O$

iv) $C_3H_8 + 5O_2 \rightarrow 3CO_2 + 4H_2O$

v) $2Na + H_2O \rightarrow Na_2O + H_2$