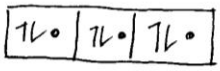
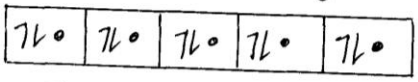
Q_2 (a) - In planet Q2ac-α, 3 spin quantum numbers ($m_s = 0, +\frac{1}{2}, -\frac{1}{2}$)

(i) $p_x^3\ p_y^3\ p_z^3$



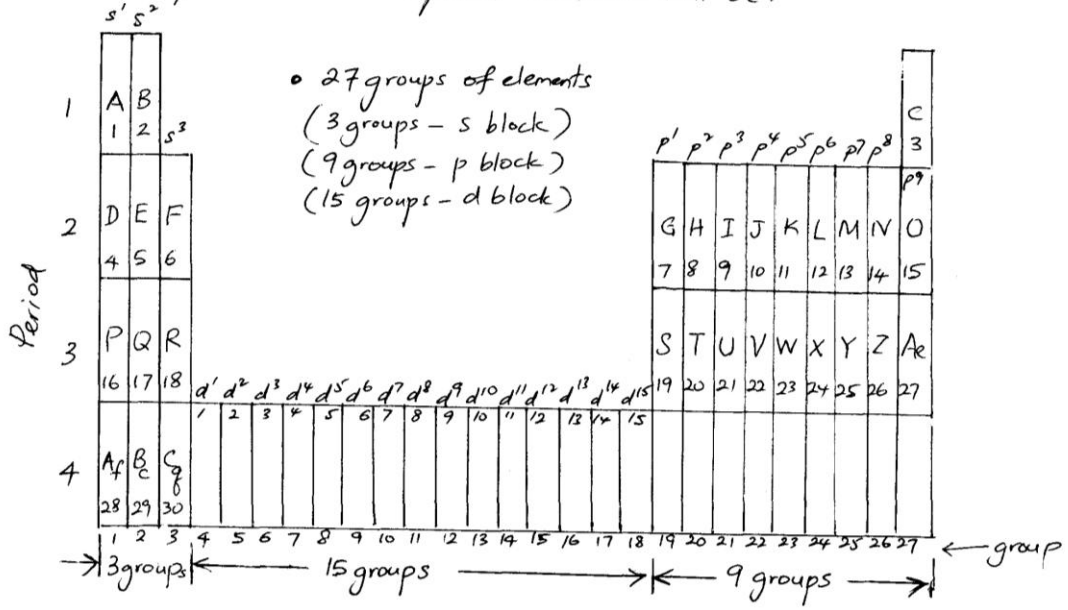
} 9 groups of p-elements in the periodic table.

(ii) $d_{xy}^3\ d_{xz}^3\ d_{yz}^3\ d_{x^2-y^2}^3\ d_{z^2}^3$



} 15 groups of d-elements in the periodic table

(iii) The periodic table in planet Q2ac-α will be:



(iv) The first three noble gas on planet Q2ac-α are

$_{3}C$, $_{15}O$, $_{27}Ae$

(v) $F \xrightarrow{-3e^-} F^{3+}$

$1s^3\ 2s^3 \qquad 1s^3$

Z

$1s^3 2s^3 2p^9 3s^3 3p^8 + e^- \longrightarrow 1s^3 2s^3 2p^9 3s^3 3p^9$

Z^-

$F^{3+}\ Z^-$

FZ_3

(ionic compound)

½

Q_2 (6)

An orbital is a three-dimensional region in which there is a very high probability of finding an electron. Atomic orbitals are designated as 1s, 2p, 3d, 4f..... where the numerals indicate the distance from the nucleus (or the atomic energy levels) and the letters indicate its shape. Molecular orbitals have geometries determined by the overlap of two or more atomic orbitals to form σ bonds or π bonds. - Orbital refer to the Schrodinger model of the atom.

An orbit means the path on which electron is assumed to be revolving around the nucleus. Strictly speaking "electron orbits" refer to the Bohr Model of the atom – that electron in an atom have a particular energy – electron energies are quantized.

Difference between orbit and orbital.

Orbit	orbital
1. It is well-defined circular path followed by the electron around nucleus.	1. It is a region of space around the nucleus where the probability of find an electron is maximum
2. It represents two dimensional motion of electron around nucleus.	2. It represents three dimensional motion of electron around nucleus.
3. The maximum no. of electron in an orbit is $2n^2$.	3. The maximum no. of electrons in an orbital is 2
4. Orbit is circular in shape	4. Orbitals have different shapes.

2/2

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