



1- Which family of silicates do the following minerals belong to? (1 point)

Garnets: **Nesosilicates** 0.25

Beryl: **Cyclosilicates** 0.25

Epidote: **Sorosilicates** 0.25

Pyroxenes and amphiboles: **Inosilicates** 0.25

2- Mention two minerals are non-metal (1 point)

a) **Diamond** 0.5 b) **Graphite** 0.5

3- Isomorphism, Isotypism or Polymorphism? (1 point)

Isotypism: Two mineral species are isotypes when they have distinct chemical compositions but similar structural formulas.

4-To which family of silicates do the minerals whose formulas are the following belong? (1 point)

Epidote $\text{Ca}_2(\text{Fe,Al})\text{Al}_2[(\text{O OH})_2\text{Si}_2\text{O}_7]$ **Sorosilicate** 0.25

Beryl $\text{Al}_2\text{Be}[\text{Si}_6\text{O}_{18}]$ **Cyclosilicate** 0.25

Diopside $\text{CaMg}(\text{Si}_2\text{O}_6)$ **Inosilicates** 0.25

Quartz (SiO_2) **Tectosilicate** 0.25

5- Cyclosilicates (Silicates with tetrahedrons associated in rings) (1.5 point)

The rings have 3, 4 or 6 tetrahedra, hence the structural formulas:

06 tetrahedrons **$[\text{Si}_6\text{O}_{18}]^{12-}$** 0.5, 03 tetrahedrons **$[\text{Si}_3\text{O}_9]^{6-}$** 0.5, 04 tetrahedrons **$[\text{Si}_4\text{O}_{12}]^{8-}$** 0.5

6- Tectosilicates are subdivided into 5 groups or families: (1 point)

- silica group ✓
- feldspar group ✓
- feldspathoid group ✓
- zeolite group ✓
- scapolite group ✓

7- Olivines are Nesosilicates of which there is an iron variety and a magnesium variety. (2 point)

• Write the formula of Forsterite, knowing that it is a magnesium olivine: **Mg_2SiO_4** 0.5

• Write the formula of Fayalite, knowing that it is an iron olivine: **Fe_2SiO_4** 0.5

• Can an olivine contain both iron and magnesium? 0.5 **Yes**,

(Write the formula) **$(\text{SiO}_4)(\text{FeMg})_2$** 0.5

8- Which is not a silicate mineral: (1 point)

a) Olivine **b) Arragonite** c) Amphibole d) Sodalite



9- Fools gold refers to: **(1 point)**

- a) Bornite b) Sphalerite c) Galena d) Pyrite

10- Diamond belong to which crystalline system: **(1 point)**

- a) Quadratic b) Cubic c) Rhombohedral d) Hexagonal

11- Which is not an ore of iron? **(1 point)**

- a) Magnetite b) Cassiterite c) Siderite d) Sphalerite

12- Refers to the mass per volume: **(1 point)**

- a) Hardness b) Gravity c) Density d) Viscosity

13- When two mineral species are have distinct chemical compositions but similar structural formulas: **(1 point)**

- a) Idiomorphism b) Isotypism c) pseudomorphism d) All answers are wrong

14- The way a mineral transmits light is called: **(1 point)**

- a) Opaque b) Reflection c) Refraction d) Transparency

15- Which of the following minerals belong to the oxide group? **(1 point)**

- a) Scheelite (CaWO_4) b) Hematite (Fe_2O_3) c) Barite (BaSO_4) d) Nitratine NaNO_3

16- To which family of silicates do the following mineral groups belong? **(1 point)**

Pyroxenes Group Amphiboles Group	}	Inosilicates	0.5
Chlorite group: clino-chlorine Clay group: Kaolin, Montmorillonite	}	Phyllosilicates	0.5

17- Mineral groups? **1 point**

Sylvite	KCl	0.25	Halides
Fluorite	CaF_2	0.25	Halides
Ilmenite	FeTiO_3	0.25	Oxides
Siderite	FeCO_3	0.25	Carbonates

18- What are the properties most commonly used in identification of a mineral are: **(1.5 point)**

Colour, streak, lustre, hardness, crystal shape (habit), cleavage, specific gravity (density).