This is a Class 1 exam

Lebanon Evangelical School
for Boys and Girls
Loueizeh - Baabda

SE01 Exam

09NOV2026

Do NOT write in this box. Your MARK will be placed here.

Subject :	Chemistry
Class :	9B, 9C and 9E
Teacher :	Mrs. Mirella Freige
Duration :	1 hour

Graph paper is needed

You are to answer the questions to this exam on : Lined paper

Your name :		*Time taken to complete exam*
Your Class :		
Exam Room :		
How many sheets, including cover sheet :		

- Do not open this paper until the teacher in charge instructs you to do so.
- The most important thing to remember in taking an exam is NEVER PANIC.
- If you are caught cheating in this exam, you will be awarded zero for ALL exams that are taken on this day.

Exercise 1: Identify the letter of the choice that best answers the statement (6.5 points)

1. The number of protons in an atom is also known as the:

   A. Mass number

   B. Atomic number

   C. Isotopic number

   D. Nucleon number

2. What is the charge of the nucleus of a neutral atom?

   A. Negative

   B. Positive

   C. Neutral

   D. Variable

3. A nuclide is best described as:

   A. A molecule with different atoms

   B. A specific type of atom characterized by its number of protons and neutrons

   C. A charged particle

   D. An element with the same number of protons but different electrons

4. Which pair represents isotopes of the same element?

   A. ^{12}C and ^{14}N

   B. ^{12}C and ^{13}C

   C. ^{2}H and ^{4}He

   D. ^{16}O and ^{16}S

5. Isotopes of an element have the same:

   A. Number of neutrons

   B. Number of protons

   C. Mass number

   D. Number of nucleons

6. An atom of chlorine (Cl) has an atomic number of 17 and a mass number of 35. How many neutrons does it have?

   A. 17

   B. 35

   C. 18

   D. 52

7. In the periodic table, elements in the same group have:

   A. The same number of occupied shells

   B. The same number of neutrons

   C. The same mass number

   D. Similar chemical properties

8. Which statement is true about elements across a period in the periodic table?

   A. They have similar properties

   B. The number of protons decreases

   C. The number of outer electrons increases by one

   D. The atomic number stays the same

9. Elements in the same **group** of the periodic table have:

A. The same number of protons

B. The same number of electron shells

C. The same number of valence electrons

D. The same atomic mass

10. Elements in the same **period** have:

A. The same number of valence electrons

B. The same chemical properties

C. The same number of occupied shells

D. The same number of protons

11. Which group of elements is known as the **Noble Gases**?

A. Group I

B. Group II

C. Group VII (17)

D. Group VIII (18)

12. The element with atomic number 11 is sodium (Na). It belongs to:

A. Group I, Period 3

B. Group III (column 13), Period 3

C. Group III, Period 1

D. Group VIII (column 18), Period 3

13. Which statement is **true** about elements in **Group VIII (column 18)**?

A. They are very reactive

B. They have full outer electron shells

C. They easily form compounds

D. They have one valence electron

Exercise 2: Some Chemical Elements Present in Milk (8.5 points)

The table below shows the amounts (in mg) of certain chemical elements present in 100 g of milk.

Elements	Potassium K	Calcium Ca	Chlorine Cl	Phosphorus P	Sodium Na
Amounts (in mg) of Elements in 100 g of Milk	140	130	100	90	75

1. Plot a bar chart (histogram) showing the amounts (in mg) of each element listed in the table.
   Take the following scale: ordinate: 1 cm = 20 mg.

2. Calcium belongs to group II and period 4.
   Write the electron configuration of a calcium atom, then determine its atomic number.

3. Sodium and potassium belong to group I, while chlorine belongs to group VII.
   Name the chemical family to which each of these elements belongs.

4. Chlorine has 17 electrons in its electron cloud.

   4.1. Determine its atomic number.

The mass number (A) of a chlorine atom is given by the following relation: A= 2Z+1.

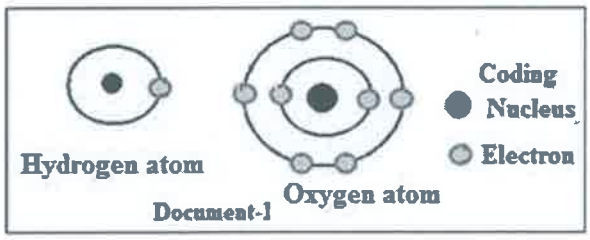
4.2. Calculate its mass number and deduce the number of neutrons.

4.3. Write the electron configuration of a chlorine atom, then determine its group (column) and period (row) in the periodic table.

Exercise 3: Chemical Elements of the Human Body (7 points)

Six elements—oxygen, carbon, hydrogen, nitrogen, calcium, and phosphorus—account for 98.5% of the human body's mass. Since the human body is composed mostly of water, oxygen is the most abundant element by mass. Carbon (C), the fundamental element of organic molecules found in cells, ranks second.

Document 1 shows schematic representations of hydrogen and oxygen atoms.



Document-1

1. By referring to **Document 1**, answer the following questions:

   1.1 Determine the atomic number of an oxygen atom.

   1.2 Calculate the total relative charge of the electron cloud of a hydrogen atom, given that the relative charge of an electron is **-1**.

2. **Document 2** shows the atomic number and the mass number of four atoms A, B, C and D.

Atom	A	B	C	D
Atomic number	6	20	6	18
Mass number	12	40	14	40

Document 2

   2.1 Identify the isotopes among these four atoms and justify your answer.

2.2 One of the preceding isotopes represents the fundamental element found in organic molecules in cells.

2.2.1 Identify the name of this element from the text.

2.2.2 Write the symbolic representation of an atom of this element, given that its mass number is 12.

3. The electron configuration of the nitride ion (N^{3-}) is K^2L^8.

Choose, from among the electron configurations given below, the one that corresponds to a neutral nitrogen atom. Justify your choice.

a. $K^2\ L^3$ **b.** $K^2\ L^8\ M^3$ **c.** $K^2\ L^5$

Exercise I (0.5 each)

1. B	6. C	11. D
2. B	7. D	12. A
3. B	8. C	13. B
4. B	9. C	
5. B	10. C	

Exercise II. (8.5 pts)

1. Histogram on the graph paper.

2. Ca belongs to period 4 $\Rightarrow$ Ca has 4 occupied shells (1/4) and to G II $\Rightarrow$ Ca has 2 valence electrons (1/4)
So, its configuration is: $K^2L^8M^8N^2$ (K, L, M: Saturated) (1/4)
Number of $\bar{e}$ = 2+8+8+2 = 20 $\bar{e}$ (1/4) (1/4)
In a neutral atom, number of $\bar{e}$ = number of p^+ = atomic number Z = 20. (1/2)

3. Na, K: G I: Alkali Metals (1/2)
Cl: G VII: Halogens (1/2)

4. 4.1. In a neutral atom, atomic number Z = number of p^+ = number of $\bar{e}$ = 17. (1)

4.2. A = 2Z + 1 = 2(17) + 1 = 35 (1/2)
Number of neutrons: N = A − Z = 35 − 17 = 18. (1/2)

4.3. Cl: $K^2L^8M^7$
G: valence electrons: VII (col. 17) (3/4)
P: occupied shells: 3 (row 3) (3/4)

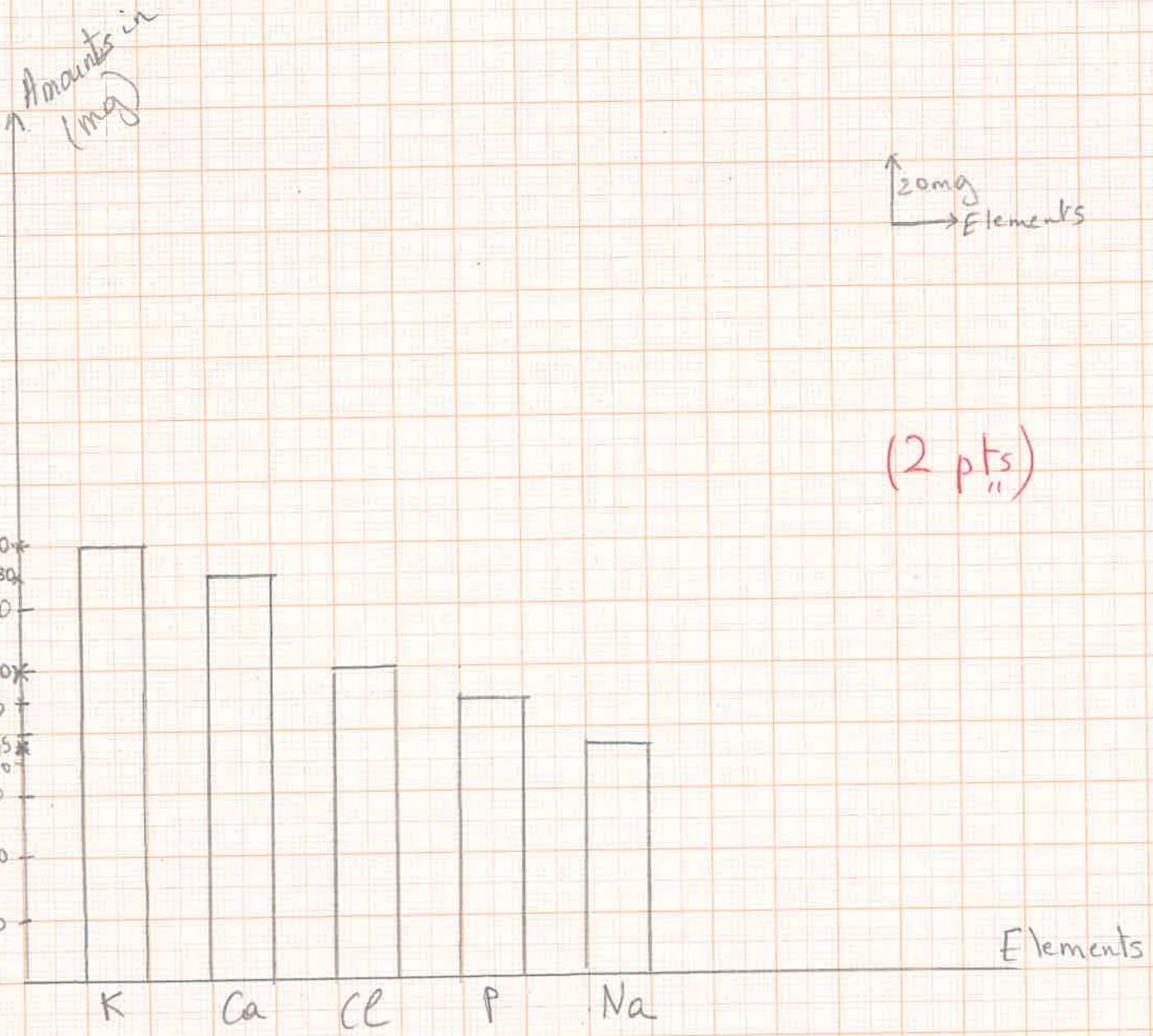
III 1.1. Based on Document 1, Oxygen has 8 electrons; (1/2)
So 8 protons ⇒ Atomic number Z = 8. (1/2)
(Neutral Atom) (1/2)

1.2. Charge of oxygen cloud
= number of $\bar{e}$ × charge of an $\bar{e}$ (1/2)
= 8 × (−1)
= −8. (1/2)

2.1. Isotopes: have the same atomic number Z (1)
So, A and C are isotopes (having same atomic number Z = 6)
(1/2)

2.2.1. Carbon. (1)
2.2.2. $^{12}_{6}C$ (1)

3. N^{3-}: K^2L^8 : It's an ion with 3 negative charges;
⇒ the nitrogen atom has gained 3 $\bar{e}$ (1/2)
So the neutral atom (N) has 5 valene $\bar{e}$ (8 − 3)
and its configuration is: K^2L^5 (C).
(1/2)



(2 pts)

Histogram showing the amounts of elements in 100g of milk.