

Nr.	Items	Score	
		1	2
1	Complete the blank space of the proposed sentences: 1) Name of the chemical element that has the spread of electrons on energetic levels $2\bar{e} 8\bar{e} 5\bar{e}$ is ..... and shows in the compounds the maximum valency ..... and minimum valency ..... 2) The atom of the chemical element with atomic number 19 contains in its nucleus ..... protons and ..... neutrons. 3) The volatile compound of sulfur with hydrogen has the formula ..... and is called ..... 4) In the line Be – Mg – Ca, the metallic properties..... 5) The element with nucleus charge +13 forms higher hydroxide with the formula ..... 6) The element that forms higher oxide with the composition $E_2O_7$ is called .....	L	L
		0	0
		1	1
		2	2
		3	3
		4	4
		5	5
		6	6
		7	7
		8	8
		9	9
10	10		
2	Fireworks are a traditional part of many holidays, which produce bright and sound effects. They include many chemicals as follows: S, $CaCl_2$ , C, Mg. <b>I. I.</b> Write in the blank space to the right of the formulas of substances used in fireworks, the appropriate type of chemical bond: 1. S ..... 2. $CaCl_2$ ..... 3. C ..... 4. Mg ..... <b>II.</b> Select and write in the space reserved the formula of a substance from the above proposed, appropriate to characteristic: a) The substance conducts electricity well ..... b) It is a solid yellow substance ..... c) The substance dissolves well in water ..... d) The substance is used to reduce metal oxides .....	L	L
		0	0
		1	1
		2	2
		3	3
		4	4
		5	5
		6	6
		7	7
8	8		
3	Zinc oxide is used in medical cosmetics, because it has anti-inflammatory and antiseptic effects. <b>I.</b> Complete the reaction schemes which characterize the chemical properties of zinc oxide, with the formulas of the substances and the appropriate coefficients: a) $ZnO + HNO_3 \rightarrow$ ..... b) $ZnO + Al \rightarrow$ ..... <b>II.</b> Write the reaction equation of obtaining of zinc oxide, according to the schemes: a) metal + oxygen ..... b) decomposition of zinc hydroxide .....	L	L
		0	0
		1	1
		2	2
		3	3
		4	4
		5	5
		6	6
		7	7
		8	8



<p><b>6</b></p>	<p>Circle the letter <b>T</b>, if the statement is true and the letter <b>F</b>, if it is false.</p> <p>1) <b>T F</b> The number of electrons in the electronic shell of the atom coincides numerically with the number of neutrons in the nucleus.</p> <p>2) <b>T F</b> Salts of sulphuric acid are called sulphates.</p> <p>3) <b>T F</b> The oxygen that has the amount of 2 mol of substance normally occupies a volume of 44.8 l.</p> <p>4) <b>T F</b> Cast iron and steel are alloys of iron and carbon.</p> <p>5) <b>T F</b> Alkaline bases dissociate into solutions in metal cations and acid rest anions.</p> <p>6) <b>T F</b> In acid solutions <math>\text{pH} &lt; 7</math>.</p> <p>7) <b>T F</b> 200 g of a solution and a mass fraction of 20% of the dissolved substance contains 40 g of a substance.</p>	<table border="1"> <tr><td>L</td></tr> <tr><td>0</td></tr> <tr><td>1</td></tr> <tr><td>2</td></tr> <tr><td>3</td></tr> <tr><td>4</td></tr> <tr><td>5</td></tr> <tr><td>6</td></tr> <tr><td>7</td></tr> </table>	L	0	1	2	3	4	5	6	7	<table border="1"> <tr><td>L</td></tr> <tr><td>0</td></tr> <tr><td>1</td></tr> <tr><td>2</td></tr> <tr><td>3</td></tr> <tr><td>4</td></tr> <tr><td>5</td></tr> <tr><td>6</td></tr> <tr><td>7</td></tr> </table>	L	0	1	2	3	4	5	6	7																
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<p><b>7</b></p>	<p><i>Aluminum phosphate</i> is used to obtain special optical glasses.</p> <p><b>I.</b> Fill in the blank spaces of the table below with the chemical formulas and the names of the soluble salts, at the interaction of which the <i>aluminum phosphate</i> is formed:</p> <table border="1"> <thead> <tr> <th>No.</th> <th>Ions</th> <th>Chemical formula of a soluble salt</th> <th>Name of salt</th> </tr> </thead> <tbody> <tr> <td>1</td> <td><math>\text{Al}^{3+}</math></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td><math>\text{PO}_4^{3-}</math></td> <td></td> <td></td> </tr> </tbody> </table> <p><b>II.</b> Write the equation of the obtaining reaction of the <i>aluminum phosphate</i> in molecular form (ME), completed ionic (CIE) and reduced ionic (RIE), using the solubility table and the formulas of the composed salts:</p> <p>_____ (ME)</p> <p>_____ (CIE)</p> <p>_____ (RIE)</p>	No.	Ions	Chemical formula of a soluble salt	Name of salt	1	$\text{Al}^{3+}$			2	$\text{PO}_4^{3-}$			<table border="1"> <tr><td>L</td></tr> <tr><td>0</td></tr> <tr><td>1</td></tr> <tr><td>2</td></tr> <tr><td>3</td></tr> <tr><td>4</td></tr> <tr><td>5</td></tr> <tr><td>6</td></tr> <tr><td>7</td></tr> <tr><td>8</td></tr> <tr><td>9</td></tr> </table>	L	0	1	2	3	4	5	6	7	8	9	<table border="1"> <tr><td>L</td></tr> <tr><td>0</td></tr> <tr><td>1</td></tr> <tr><td>2</td></tr> <tr><td>3</td></tr> <tr><td>4</td></tr> <tr><td>5</td></tr> <tr><td>6</td></tr> <tr><td>7</td></tr> <tr><td>8</td></tr> <tr><td>9</td></tr> </table>	L	0	1	2	3	4	5	6	7	8	9
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<p><b>8</b></p>	<p>Choose and write in the space reserved, the word from the brackets that correctly completes each of the statements:</p> <p>1) The general formula of saturated monoalcohols is ..... (<math>C_nH_{2n+1}COOH / C_nH_{2n+1}OH</math>)</p> <p>2) Ester are substances ..... (odorless / with a specific odor)</p> <p>3) Synthetic rubbers are obtained by polymerization of..... (alkanes/ alcadienes)</p> <p>4) Polyalcohols are identified with ..... (copper( II ) hydroxide / bromine water )</p> <p>5) Aminopropanoic acid is also called..... ( glycine / alanine )</p> <p>6) Animal fats are mostly..... (solids / liquids)</p> <p>7) The carbon hydrate that is subject to hydrolysis is..... ( sucrose / glucose )</p> <p>8) Alkanes are characteristic of .....reactions. ( substitution / addition )</p>	<table border="1"> <tr><td>L</td></tr> <tr><td>0</td></tr> <tr><td>1</td></tr> <tr><td>2</td></tr> <tr><td>3</td></tr> <tr><td>4</td></tr> <tr><td>5</td></tr> <tr><td>6</td></tr> <tr><td>7</td></tr> <tr><td>8</td></tr> </table>	L	0	1	2	3	4	5	6	7	8	<table border="1"> <tr><td>L</td></tr> <tr><td>0</td></tr> <tr><td>1</td></tr> <tr><td>2</td></tr> <tr><td>3</td></tr> <tr><td>4</td></tr> <tr><td>5</td></tr> <tr><td>6</td></tr> <tr><td>7</td></tr> <tr><td>8</td></tr> </table>	L	0	1	2	3	4	5	6	7	8														
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**9** Alkynes, which contain five carbon atoms, are raw materials for the production of synthetic rubbers.

It is proposed the alkyne:  $CH \equiv C - CH_2 - CH_2 - CH_3$

*For this alkyne:*

**I.** Write the name according to the systematic nomenclature: \_\_\_\_\_

**II.** Write the molecular formula of the substance and the general formula of the homologous series:

\_\_\_\_\_

*molecular formula*

\_\_\_\_\_

*formula of the homologous series*

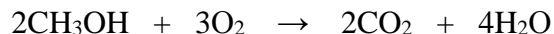
**III.** Complete the blank spaces of the table:

	<i>Structural semi- developed formula</i>	<i>Name</i>
Chain isomer		
Triple bond position isomer		
Homologue		

L	L
0	0
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9

**10** Due to its high octane number, methanol is used as fuel for motorcycles and racing cars.

**Solve the problem.** Calculate the volume of oxygen (STP) required for burning methanol with a weight of 6,4 g, if the reaction proceeds according to the following scheme:



*It is given:*

*Solution:*

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*Answer:* \_\_\_\_\_

L	L
0	0
1	1
2	2
3	3
4	4
5	5
6	6

<b>11</b>	<p><b>I.</b> For each substance in column <b>A</b> select a possible reagent in column <b>B</b> and indicate the corresponding letter in the space reserved:</p> <table style="width: 100%; margin-left: 20px;"> <tr> <td style="width: 50%; text-align: center;"><b>A</b></td> <td style="width: 50%; text-align: center;"><b>B</b></td> </tr> <tr> <td>1) ..... HCOOH</td> <td>a) NaOH</td> </tr> <tr> <td>2) ..... CH<sub>3</sub>COOC<sub>2</sub>H<sub>5</sub></td> <td>b) Cl<sub>2</sub></td> </tr> <tr> <td>3) ..... CH<sub>2</sub>=CH-CH<sub>3</sub></td> <td>c) HOH</td> </tr> </table> <p><b>II.</b> Write the equations of chemical reactions for the chosen interactions:</p> <p>1. _____</p> <p>2. _____</p> <p>3. _____</p>	<b>A</b>	<b>B</b>	1) ..... HCOOH	a) NaOH	2) ..... CH <sub>3</sub> COOC <sub>2</sub> H <sub>5</sub>	b) Cl <sub>2</sub>	3) ..... CH <sub>2</sub> =CH-CH <sub>3</sub>	c) HOH	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="text-align: center;">L</td></tr> <tr><td style="text-align: center;">0</td></tr> <tr><td style="text-align: center;">1</td></tr> <tr><td style="text-align: center;">2</td></tr> <tr><td style="text-align: center;">3</td></tr> <tr><td style="text-align: center;">4</td></tr> <tr><td style="text-align: center;">5</td></tr> <tr><td style="text-align: center;">6</td></tr> <tr><td style="text-align: center;">7</td></tr> <tr><td style="text-align: center;">8</td></tr> <tr><td style="text-align: center;">9</td></tr> </table>	L	0	1	2	3	4	5	6	7	8	9	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="text-align: center;">L</td></tr> <tr><td style="text-align: center;">0</td></tr> <tr><td style="text-align: center;">1</td></tr> <tr><td style="text-align: center;">2</td></tr> <tr><td style="text-align: center;">3</td></tr> <tr><td style="text-align: center;">4</td></tr> <tr><td style="text-align: center;">5</td></tr> <tr><td style="text-align: center;">6</td></tr> <tr><td style="text-align: center;">7</td></tr> <tr><td style="text-align: center;">8</td></tr> <tr><td style="text-align: center;">9</td></tr> </table>	L	0	1	2	3	4	5	6	7	8	9																
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<b>12</b>	<p><b>I.</b> Complete the blank spaces of the table with the structural semi-developed formulas and the names of the organic substances corresponding to the characteristics:</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-left: 20px;"> <thead> <tr> <th style="width: 10%;"><i>No.</i></th> <th style="width: 30%;"><i>Characteristic of substance</i></th> <th style="width: 30%;"><i>Structural semi-developed formula</i></th> <th style="width: 30%;"><i>Name of the substance</i></th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1</td> <td>It is a food spice</td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">2</td> <td>It refers to aromatic hydrocarbons</td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">3</td> <td>Corresponds to the general formula C<sub>n</sub>H<sub>2n</sub>O</td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">4</td> <td>It is used to obtain polyethylene</td> <td></td> <td></td> </tr> </tbody> </table> <p><b>II.</b> Write for one of the substances in the table:</p> <p>a) a physical property:</p> <p>_____</p> <p>b) the equation of the obtaining reaction:</p> <p>_____</p>	<i>No.</i>	<i>Characteristic of substance</i>	<i>Structural semi-developed formula</i>	<i>Name of the substance</i>	1	It is a food spice			2	It refers to aromatic hydrocarbons			3	Corresponds to the general formula C <sub>n</sub> H <sub>2n</sub> O			4	It is used to obtain polyethylene			<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="text-align: center;">L</td></tr> <tr><td style="text-align: center;">0</td></tr> <tr><td style="text-align: center;">1</td></tr> <tr><td style="text-align: center;">2</td></tr> <tr><td style="text-align: center;">3</td></tr> <tr><td style="text-align: center;">4</td></tr> <tr><td style="text-align: center;">5</td></tr> <tr><td style="text-align: center;">6</td></tr> <tr><td style="text-align: center;">7</td></tr> <tr><td style="text-align: center;">8</td></tr> <tr><td style="text-align: center;">9</td></tr> <tr><td style="text-align: center;">10</td></tr> <tr><td style="text-align: center;">11</td></tr> </table>	L	0	1	2	3	4	5	6	7	8	9	10	11	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="text-align: center;">L</td></tr> <tr><td style="text-align: center;">0</td></tr> <tr><td style="text-align: center;">1</td></tr> <tr><td style="text-align: center;">2</td></tr> <tr><td style="text-align: center;">3</td></tr> <tr><td style="text-align: center;">4</td></tr> <tr><td style="text-align: center;">5</td></tr> <tr><td style="text-align: center;">6</td></tr> <tr><td style="text-align: center;">7</td></tr> <tr><td style="text-align: center;">8</td></tr> <tr><td style="text-align: center;">9</td></tr> <tr><td style="text-align: center;">10</td></tr> <tr><td style="text-align: center;">11</td></tr> </table>	L	0	1	2	3	4	5	6	7	8	9	10	11
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## SISTEMUL PERIODIC AL ELEMENTELOR CHIMICE

	I	II	III	IV	V	VI	VII	VIII					
1	1 <b>H</b> 1,0079 Hidrogen									2 <b>He</b> 4,0026 Helium			
2	3 <b>Li</b> 6,941 Litiu	4 <b>Be</b> 9,01218 Beriliu	5 <b>B</b> 10,81 Bor	6 <b>C</b> 12,011 Carbon	7 <b>N</b> 14,0067 Azot	8 <b>O</b> 15,9994 Oxigen	9 <b>F</b> 18,9984 Fluor	10 <b>Ne</b> 20,179 Neon					
3	11 <b>Na</b> 22,98977 Sodiu	12 <b>Mg</b> 24,305 Magneziu	13 <b>Al</b> 26,98154 Aluminiu	14 <b>Si</b> 28,0855 Siliciu	15 <b>P</b> 30,97376 Fosfor	16 <b>S</b> 32,06 Sulf	17 <b>Cl</b> 35,453 Clor	18 <b>Ar</b> 39,948 Argon					
4	19 <b>K</b> 39,0983 Potasiu	20 <b>Ca</b> 40,08 Calciu	21 44,9559 Scandiu	22 47,88 Titan	23 50,9415 Vanadiu	24 51,996 Crom	25 54,938 Mangan	26 55,847 Fier	27 58,9332 Cobalt	28 58,69 Nichel			
	29 63,546 Cupru	30 65,38 Zinc	31 69,72 Galiu	32 72,59 Germaniu	33 74,9216 Arsen	34 78,96 Seleniu	35 79,904 Brom	36 83,80 Kripton					
5	37 85,4678 Rubidiu	38 87,62 Stronțiu	39 88,9059 Ytriu	40 91,22 Zirconiu	41 92,9064 Niobiu	42 95,94 Molibden	43 [98] Tehnețiu	44 101,07 Ruteniu	45 102,9055 Rodiu	46 106,42 Paladiu			
	47 107,868 Argint	48 112,41 Cadmium	49 114,82 Indiu	50 118,69 Staniu	51 121,75 Stibiu	52 127,60 Telur	53 126,9045 Iod	54 131,29 Xenon					
6	55 132,9054 Ceziu	56 137,33 Bariu	57* 138,9055 Lantan	72 178,49 Hafniu	73 180,948 Tantal	74 183,85 Volfram	75 186,207 Reni	76 190,2 Osmiu	77 192,22 Iridiu	78 195,08 Platina			
	79 196,9665 Aur	80 200,59 Mercur	81 204,383 Taliu	82 207,2 Plumb	83 208,9804 Bismut	84 [209] Poloni	85 [210] Astatiniu	86 [222] Radon					
7	87 [223] Franciu	88 226,0254 Radium	89** 227,0278 Actiniu	104 [261] Rutherfordium	105 [262] Dubnium	106 [263] Seaborgium	107 [262] Bohrium	108 [267,13] Hassium	109 [268,14] Meitnerium	110 [281] Darmstadtium			

### \*Lantanie

58 140,12 Ce Ceriu	59 140,9077 Pr Praseodim	60 144,24 Nd Neodim	61 [145] Pm Prometiu	62 150,36 Sm Samariu	63 151,96 Eu Europiu	64 157,25 Gd Gadolinu	65 158,9254 Tb Terbiu	66 162,50 Dy Disprosiu	67 164,9304 Ho Holmiu	68 167,26 Er Erbiu	69 168,9342 Tm Tuliu	70 173,04 Yb Yterbiu	71 174,967 Lu Lutetiu
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### \*\*Actinide

90 232,0381 Th Toriu	91 231,0359 Pa Protactiniu	92 238,0389 U Uranu	93 237,0482 Np Neptuniu	94 [244] Pu Plutoni	95 [243] Am Americiu	96 [247] Cm Curiu	97 [247] Bk Berkeliu	98 [251] Cf Californiu	99 [252] Es Einsteiniu	100 [257] Fm Fermiu	101 [258] Md Mendeleviu	102 [255] No Nobeliu	103 [260] Lr Lawrenciu
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## SOLUBILITATEA ACIZILOR, BAZELOR, SĂRURILOR ÎN APĂ

	H <sup>+</sup>	NH <sub>4</sub> <sup>+</sup>	Li <sup>+</sup>	Na <sup>+</sup>	K <sup>+</sup>	Ba <sup>2+</sup>	Ca <sup>2+</sup>	Mg <sup>2+</sup>	Al <sup>3+</sup>	Cr <sup>3+</sup>	Zn <sup>2+</sup>	Mn <sup>2+</sup>	Fe <sup>2+</sup>	Fe <sup>3+</sup>	Pb <sup>2+</sup>	Cu <sup>2+</sup>	Ag <sup>+</sup>
OH <sup>-</sup>		S↑	S	S	S	S	P	I	I	I	I	I	I	I	I	I	-
F <sup>-</sup>	S	S	P	S	S	P	I	I	P	I	S	S	I	I	I	S	S
Cl <sup>-</sup>	S	S	S	S	S	S	S	S	S	S	S	S	S	S	P	S	I
Br <sup>-</sup>	S	S	S	S	S	S	S	S	S	S	S	S	S	S	P	S	I
I <sup>-</sup>	S	S	S	S	S	S	S	S	S	S	S	S	S	-	I	-	I
S <sup>2-</sup>	S↑	S	S	S	S	S	S	S	-	-	I	I	I	-	I	I	I
SO <sub>3</sub> <sup>2-</sup>	S↑	S	S	S	S	I	I	I	-	-	I	-	I	-	I	I	I
SO <sub>4</sub> <sup>2-</sup>	S	S	S	S	S	I	P	S	S	S	S	S	S	S	I	S	P
CO <sub>3</sub> <sup>2-</sup>	S↑	S	S	S	S	I	I	I	-	-	I	I	I	-	I	-	I
SiO <sub>3</sub> <sup>2-</sup>	I	-	S	S	S	I	I	I	-	-	I	I	I	-	I	-	-
NO <sub>3</sub> <sup>-</sup>	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
PO <sub>4</sub> <sup>3-</sup>	S	S	I	S	S	I	I	I	I	I	I	I	I	I	I	I	I
CH <sub>3</sub> COO <sup>-</sup>	S	S	S	S	S	S	S	S	S	-	S	S	S	-	S	S	S

Notă: S – substanță solubilă, I – insolubilă, P – puțin solubilă; «>» substanța nu există sau se descompune în apă; ↑ - substanța se degajă sub formă de gaz sau se descompune cu degajare de gaz

## SERIA ELECTRONEGATIVITĂȚII

<b>F</b>	<b>O</b>	<b>N</b>	<b>Cl</b>	<b>Br</b>	<b>I</b>	<b>S</b>	<b>C</b>	<b>Se</b>	<b>P</b>	<b>H</b>	<b>As</b>	<b>B</b>	<b>Si</b>	<b>Al</b>	<b>Mg</b>	<b>Ca</b>	<b>Li</b>	<b>Na</b>	<b>K</b>
4,0	3,5	3,07	3,0	2,8	2,5	2,5	2,5	2,4	2,1	2,1	2,0	2,0	1,8	1,5	1,2	1,04	1,0	0,9	0,8

## SERIA TENSIUNII METALELOR

Li K Ba Ca Na Mg Al Mn Zn Cr Fe Ni Sn Pb (H) Cu Hg Ag Pt Au