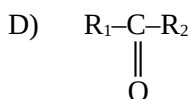
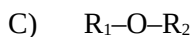
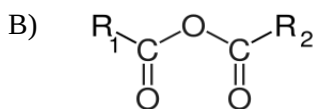
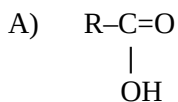


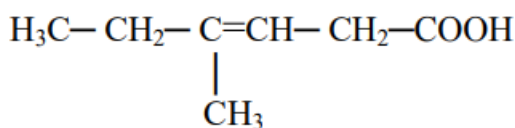
Universitatea din București Facultatea de Fizică – Admitere 2026 Test de Chimie organică	Subiectele 1-10 au un singur răspuns corect Subiectele 11 și 12 vor fi rezolvate complet N_1 = punctajul total de la subiectele 1-10 + 1p din oficiu N_2 = punctajul total de la subiectele 11-12 + 1p din oficiu Nota finală: $N = 0.6 \times N_1 + 0.4 \times N_2$
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- (0.9p)** Denumirea compusului ciclic C_3H_6 este:
 A) propenă B) ciclopropan C) propan D) ciclobutan
- (0.9p)** Toluenu este:
 A) alcan B) aminoacid C) hidrocarbură aromatică D) monozaharidă
- (0.9p)** Denumirea radicalului hidrocarbonat:
 $CH_2=CH-$
 este:
 A) etil B) propil C) etenil D) izopropil
- (0.9p)** Biopolimerii compuși din lanțuri de aminoacizi se numesc:
 A) polizaharide B) polipropilenă C) proteine D) acizi nucleici
- (0.9p)** Esterii se obțin din reacția acizilor carboxilici cu:
 A) acizii grași B) aldehydele C) cetonele D) alcoolii
- (0.9p)** O hidrocarbură conține 25% H (procente masice). Formula brută a acestui compus organic este:
 A) C_2H_4 B) CH_4 C) CH_2 D) C_4H_8
 (Masele atomice: C – 12, H – 1)

- (0.9p)** Selectați formula generală a unei anhidride acide (R , R_1 și R_2 sunt grupări alchil):



- (0.9p)** Se consideră următorul compus organic care are formula de structură:



- Raportul masic C:H din acest compus, este:

- A) 7:12 B) 3:2 C) 7:1 D) 1:7

9. **(0.9p)** Cantitatea (în grame) de alanină ($M = 89 \text{ g/mol}$) necesară pentru a prepara 100 mL de soluție de concentrație 0.3 M este:

A) 0.89 g

B) 0.3 g

C) 26.7 g

D) 2.67 g

10. **(0.9p)** Conform regulii lui Markovnikov, compusul major care rezultă în urma reacției dintre HCl și $\text{CH}_3\text{-CH=CH}_2$ este:

A) $\text{CH}_3\text{-CH}_2\text{-CH}_2\text{-Cl}$

B) $\text{CH}_3\text{-CH-CH}_3$
|
Cl

C) $\text{CH}_2\text{=CH}_2\text{-CH}_2\text{-Cl}$

D) $\text{Cl-CH}_2\text{-CH}_2\text{-CH}_2\text{-Cl}$

11. **(4p)** Săpunul de potasiu este moale și este utilizat în industria textilă. Se cer următoarele:

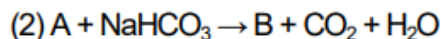
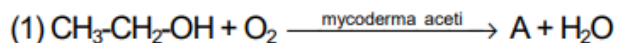
a) Specificați ce sunt săpunurile.

b) Determinați formula săpunului cu radical hidrocarbonat saturat, care are un conținut masic de 12.11% potasiu.

c) Cum se explică proprietatea de spălare a săpunurilor?

(Masele atomice: C – 12, H – 1, O – 16, K – 39)

12. **(5p)** Se consideră schema de transformări:



Se cer următoarele:

a) Scrieți ecuațiile reacțiilor din schemă.

b) Determinați cantitatea de dioxid de carbon, exprimată în moli, rezultată în reacția dintre compusul organic (A), dizolvat în 50 g de soluție apoasă de concentrație procentuală masică 9%, cu hidrogenocarbonatul de sodiu. Utilizați ecuația reacției (2) de la punctul 1.

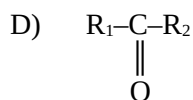
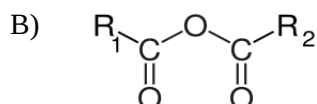
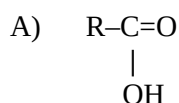
c) Precizați efectul vizibil care are loc în timpul reacției dintre compusul organic (A) și hidrogenocarbonatul de sodiu.

(Masele atomice: C – 12, H – 1, O – 16, Na – 23)

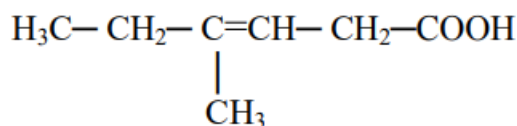
University of Bucharest
Faculty of Physics – Admission 2026
Organic Chemistry Quiz

Items 1-10 have a single correct answer
 Items 11 and 12 will be solved in detail
 N_1 = total points for items 1-10 + 1p ex officio
 N_2 = total points for items 11 and 12 + 1p ex officio
 Final grade: $N = 0.6 \times N_1 + 0.4 \times N_2$

- (0.9p)** The name of the cyclic compound C_3H_6 is:
 A) propene B) cyclopropane C) propane D) cyclobutane
- (0.9p)** Toluene is an:
 A) alkane B) amino acid C) aromatic hydrocarbon D) monosaccharide
- (0.9p)** The name of the hydrocarbon radical:
 $CH_2=CH-$
 is:
 A) ethyl B) propyl C) ethenyl D) isopropyl
- (0.9p)** Biopolymers composed of chains of amino acids are called:
 A) polysaccharides B) polypropylene C) proteins D) nucleic acids
- (0.9p)** Esters are obtained from the reaction of carboxylic acids with:
 A) fatty acids B) aldehydes C) ketones D) alcohols
- (0.9p)** A hydrocarbon contains 25% H (mass percent). The molecular formula of this organic compound is::
 A) C_2H_4 B) CH_4 C) CH_2 D) C_4H_8
 (Atomic masses: C – 12, H – 1)
- (0.9p)** Select the general formula of an acid anhydride (R , R_1 and R_2 are alkyl groups):



- (0.9p)** Consider the following organic compound that has the structural formula:



The C:H mass ratio in this compound is:

- A) 7:12 B) 3:2 C) 7:1 D) 1:7

9. **(0.9p)** The amount (in grams) of alanine ($M = 89 \text{ g/mol}$) required to prepare 100 mL of a 0.3 M solution is:
 A) 0.89 g B) 0.3 g C) 26.7 g D) 2.67 g
10. **(0.9p)** According to Markovnikov's rule, the major compound resulting from the reaction between HCl and $\text{CH}_3\text{-CH=CH}_2$ is:
 A) $\text{CH}_3\text{-CH}_2\text{-CH}_2\text{-Cl}$
 B) $\begin{array}{c} \text{CH}_3\text{-CH-CH}_3 \\ | \\ \text{Cl} \end{array}$
 C) $\text{CH}_2=\text{CH}_2\text{-CH}_2\text{-Cl}$
 D) $\text{Cl-CH}_2\text{-CH}_2\text{-CH}_2\text{-Cl}$
11. **(4p)** Potassium soap is soft and is used in the textile industry. The following are required:
 a) Specify what soaps are.
 b) Determine the formula of a soap with a saturated hydrocarbon radical, which has a mass content of 12.11% potassium.
 c) How is the washing property of soaps explained?
 (Atomic masses: C – 12, H – 1, O – 16, K – 39)
12. **(5p)** Consider the following transformation scheme:
- (1) $\text{CH}_3\text{-CH}_2\text{-OH} + \text{O}_2 \xrightarrow{\text{mycoderma aceti}} \text{A} + \text{H}_2\text{O}$
- (2) $\text{A} + \text{NaHCO}_3 \rightarrow \text{B} + \text{CO}_2 + \text{H}_2\text{O}$
- a) Write the equations of the reactions in the scheme.
 b) Determine the amount of carbon dioxide, expressed in moles, resulting from the reaction between the organic compound (A), dissolved in 50 g of an aqueous solution of 9% mass percentage concentration, with sodium hydrogen carbonate. Use the reaction equation (2) from point 1.
 c) Specify the visible effect that occurs during the reaction between the organic compound (A) and sodium hydrogen carbonate.
 (Atomic masses: C – 12, H – 1, O – 16, Na – 23)