

ΤΑΞΗ: Β' ΓΕΝΙΚΟΥ ΛΥΚΕΙΟΥ

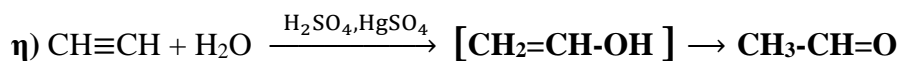
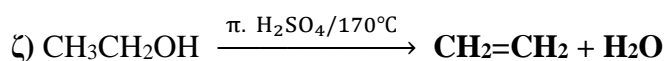
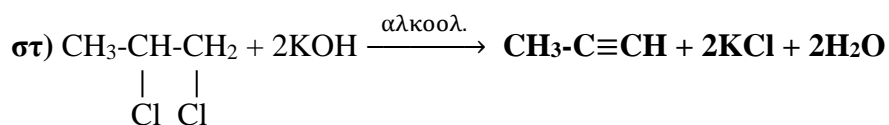
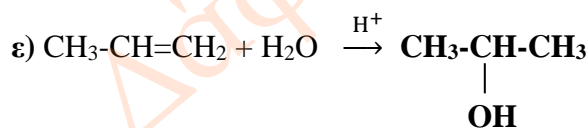
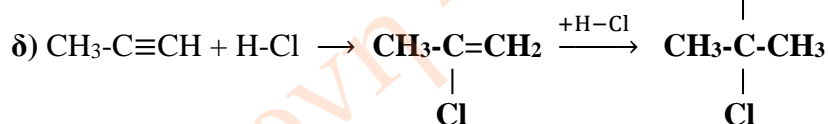
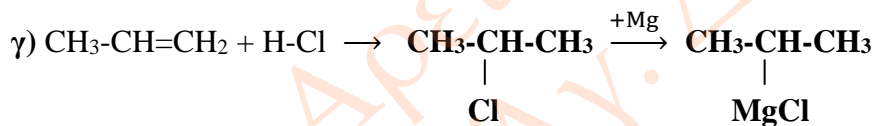
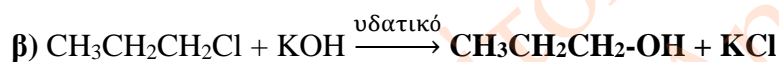
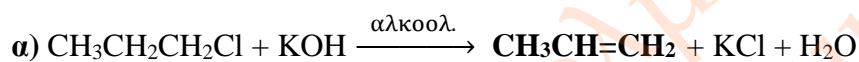
ΕΞΕΤΑΖΟΜΕΝΟ ΜΑΘΗΜΑ: ΧΗΜΕΙΑ

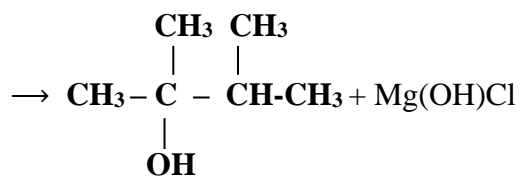
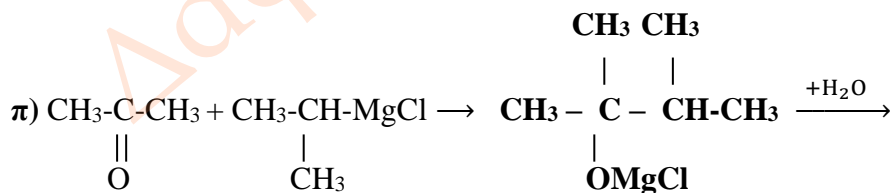
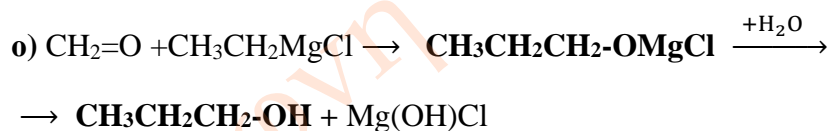
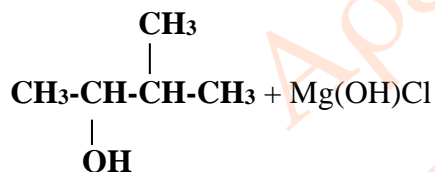
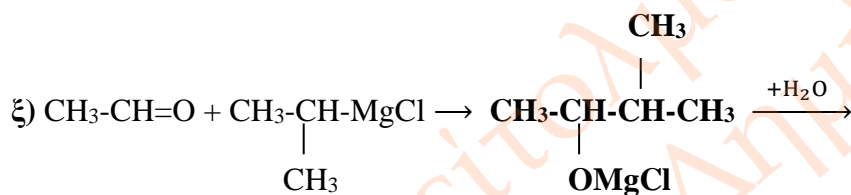
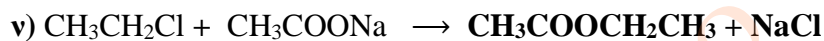
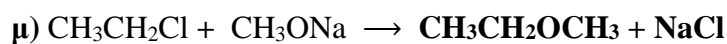
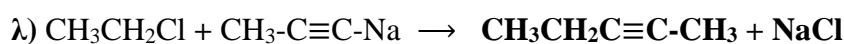
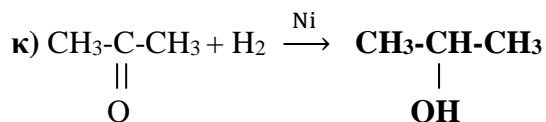
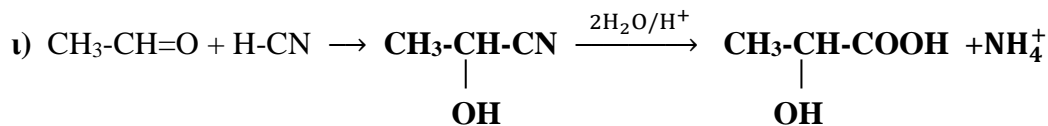
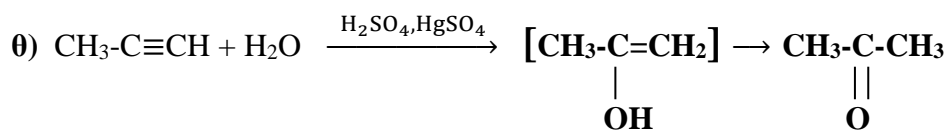
ΘΕΜΑ Α

A1) Γ A2) Δ A3) Γ A4) Δ A5) Γ

ΘΕΜΑ Β

B1)





B2) (A) CH₃Cl (B) CH₃CN (Γ) CH₃COOH (Δ) CH₃ONa (E) CH₃COOCH₃

B3) 1. (A) CH₃-CH=CH-CH₃ (συμμετρικό)

2. (B) CH₃-OH

3. (Γ) CH₂=CH₂ (Δ) CH₃CH₂-OH

4. (E) CH≡CH (ΣΤ) CH₃-CH=O

ΘΕΜΑΓ

Γ1) H₂: $m = 18\text{gr} \Rightarrow n = \frac{m}{M_r} = \frac{18\text{ gr}}{2\frac{\text{gr}}{\text{mol}}} = 9\text{mol}$



Όταν αντιδρούν 3 mol H₂, παράγονται 2 mol NH₃ και εκλύονται 90 KJ

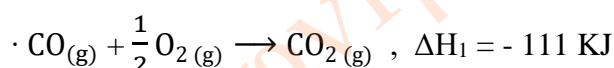
Όταν αντιδρούν 9 mol H₂, παράγονται χ mol NH₃ και εκλύονται ψ KJ

$$\cdot \chi = 6\text{ mol NH}_3, \psi = 270\text{ KJ} \Rightarrow q = +270\text{ KJ}$$

$$\text{NH}_3: m = n \cdot M_r = 6\text{ mol} \cdot 17\frac{\text{gr}}{\text{mol}} = 102\text{ gr}$$

Γ2) Έστω α mol CO και α mol H₂.

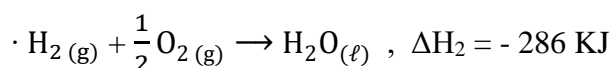
$$\cdot V_{\text{μείγμ.}} = 8,96\text{L} \Rightarrow 2\alpha \cdot 22,4 = 8,96 \Rightarrow \alpha = 0,2\text{mol}$$



Όταν αντιδρά 1 mol CO εκλύονται 111 KJ

Όταν αντιδρούν 0,2 mol CO εκλύονται χ KJ

$$\chi = 22,2\text{ KJ} \Rightarrow q_1 = +22,2\text{ KJ}$$



Όταν αντιδρά 1 mol H₂ εκλύονται 286 KJ

Όταν αντιδρούν 0,2 mol H₂ εκλύονται ψ KJ

$$\psi = 57,2\text{ KJ} \Rightarrow q_2 = +57,2\text{ KJ}$$

$$q_{\text{ολ.}} = q_1 + q_2 \Rightarrow q_{\text{ολ.}} = + 22,2 \text{ KJ} + 57,2 \text{ KJ} = 79,4 \text{ KJ}$$

Γ3) HA: $n_1 = C_1 \cdot V_1 = 0,25 \cdot 0,8 = 0,2 \text{ mol}$

NaOH: $n_2 = C_2 \cdot V_2 = 0,5 \cdot 0,5 = 0,25 \text{ mol}$

(mol)	HA	+ NaOH	→ NaA	+ H ₂ O
αρχ.	0,2	0,25	-	-
αντ./παρ.	- 0,2	- 0,2	+ 0,2	
τελ.	-	0,05	0,2	

Όταν αντιδρά 1 mol HA εκλύονται x KJ

Όταν αντιδρούν 0,2 mol HA εκλύονται 10,4 KJ

$$x = 52 \text{ KJ} \Rightarrow q = + 52 \text{ KJ} \Rightarrow \Delta H = - 52 \text{ KJ}$$

$$\alpha) \cdot n_{\text{NaOH}} = 0,05 \text{ mol}, [\text{NaOH}] = \frac{n_{\text{NaOH}}}{V_1 + V_2} = \frac{0,05 \text{ mol}}{0,8\text{L} + 0,2\text{L}} = \frac{0,05 \text{ mol}}{1\text{L}} = 0,05\text{M}$$

$$\cdot n_{\text{NaA}} = 0,2 \text{ mol}, [\text{NaA}] = \frac{n_{\text{NaA}}}{V_1 + V_2} = \frac{0,2 \text{ mol}}{0,8\text{L} + 0,2\text{L}} = \frac{0,2 \text{ mol}}{1\text{L}} = 0,2\text{M}$$

β) $\Delta H = - 52 \text{ KJ}$

ΘΕΜΑΔ

Δ1) (A) $C_n H_{2n+1} - CH=O$

(B) $C_n H_{2n+1} - CH_2 - OH$ (1°)

(Γ) αλκένιο με δ.δ στηνάκρη (n+1: άτομα C)

(Δ) κορ. μονοσθ. αλκοόλη 2° ή 3° (n+1: άτομα C)

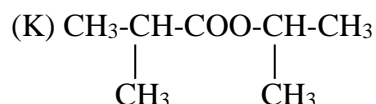
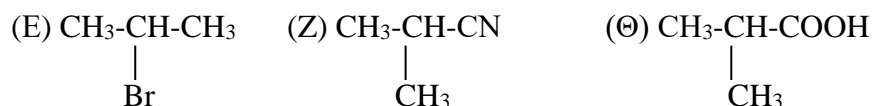
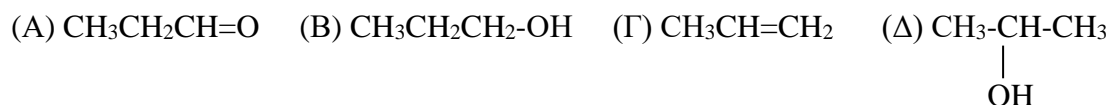
(E) αλκυλαλοβρομίδιο (n+1: άτομα C)

(Z) νιτρίλιο (n+2: άτομα C)

(Θ) κορ. μονοκαρβοξυλικό οξύ (n+2: άτομα C)

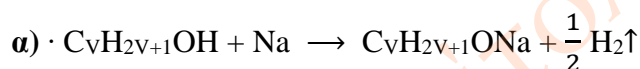
(K) κορεσμένος μονοεστέρας ($2v+3$: άτομα C)

$$\text{Άρα: } 2v+3 = 7 \Rightarrow v = 2.$$



$$\Delta 2) \text{ (X) } C_vH_{2v+1}OH : m = 17,6\text{gr} \Rightarrow n = \frac{m}{M_r} = \frac{17,6}{14v+18} \text{ mol}$$

$$H_2: V = 2,24\text{L (S.T.P)} \Rightarrow n = \frac{V}{V_m} = \frac{2,24\text{L}}{22,4 \frac{\text{L}}{\text{mol}}} = 0,1\text{mol}$$

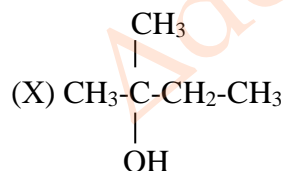


$$1\text{mol} \qquad \qquad \qquad 0,5\text{mol}$$

$$\frac{17,6}{14v+18}\text{mol} \qquad \qquad \qquad 0,1\text{mol}$$

$$\Rightarrow \frac{17,6}{14v+18} \cdot 0,5 = 0,1 \Rightarrow \frac{17,6}{14v+18} = \frac{1}{5} \Rightarrow 88 = 14v + 18 \Rightarrow 14v = 70 \Rightarrow v = 5$$

β) Εφόσον η X δεν οξειδώνεται, καταλαβαίνουμε ότι πρόκειται για 3^ο αλκοόλη:



$$\Delta 3) \text{ CH}_3\text{-C}\equiv\text{CH: } m = 16\text{gr} \Rightarrow n = \frac{m}{M_r} = \frac{16 \text{ gr}}{40 \frac{\text{gr}}{\text{mol}}} = 0,4\text{mol}$$

$$H_2: m = 1,2\text{gr} \Rightarrow n = \frac{m}{M_r} = \frac{1,2 \text{ gr}}{2 \frac{\text{gr}}{\text{mol}}} = 0,6\text{mol}$$

$$(\text{mol}) \text{ CH}_3\text{-C}\equiv\text{CH} + \text{H}_2 \xrightarrow{\text{Ni}} \text{CH}_3\text{-CH=CH}_2$$

αρχ.	0,4	0,6	-
αντ./παρ.	- 0,4	- 0,4	+ 0,4
τελ.	-	0,2	0,4

(Συνεχίζεται η υδρογόνωση)

$$(\text{mol}) \text{ CH}_3\text{-CH=CH}_2 + \text{H}_2 \xrightarrow{\text{Ni}} \text{CH}_3\text{-CH}_2\text{-CH}_3$$

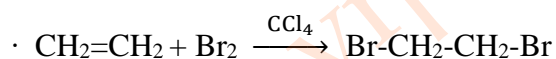
αρχ.	0,4	0,2	-
αντ./παρ.	- 0,2	- 0,2	+ 0,2
τελ.	0,2	-	0,2

i) ii) 0,2mol CH₃-CH=CH₂ και 0,2mol CH₃-CH₂-CH₃

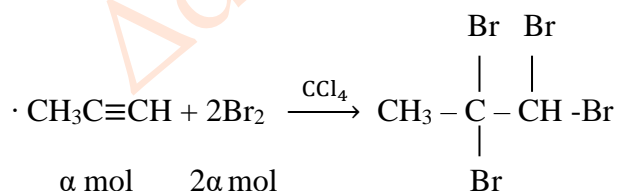
Δ4) Έστω α mol CH₂=CH₂ και α mol CH₃C≡CH.

$$\cdot m_{\text{μείγμα}} = 13,6\text{gr} \Rightarrow \alpha \cdot 28 + \alpha \cdot 40 = 13,6 \Rightarrow 68 \alpha = 13,6 \Rightarrow \alpha = 0,2\text{mol}$$

$$\text{Br}_2: C = \frac{n}{V} = \frac{m}{Mr} = \frac{\frac{16 \text{ gr}}{160 \frac{\text{gr}}{\text{mol}}}}{0,1 \text{ L}} = 1\text{M}, \quad n_{\text{Br}_2} = C \cdot V_{\text{Br}_2} = 1 \frac{\text{mol}}{\text{L}} \cdot 0,4\text{L} = 0,4\text{mol}$$



$$\alpha \text{ mol} \quad \alpha \text{ mol}$$



Τα συνολικά mol του Br₂ που χρειάζεται το μείγμα για να αντιδράσει πλήρως είναι:

$$n = 3\alpha = 3 \cdot 0,2 = 0,6\text{mol} > 0,4\text{mol} \Rightarrow \text{αντιδρά όλη η ποσότητα του Br}_2: \text{ το διάλυμα ΑΠΟΧΡΩΜΑΤΙΖΕΤΑΙ.}$$