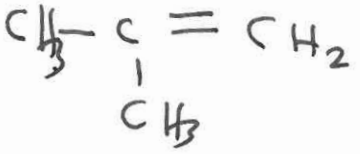
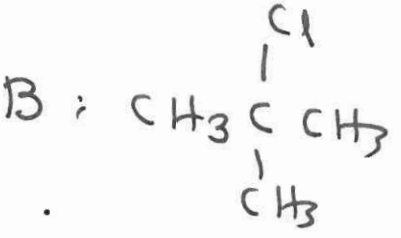
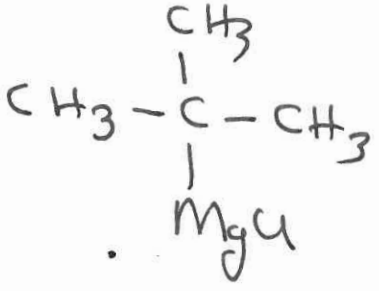
ΘΕΜΑ Α'

A_1. Β A_2. γ A_3. α A_4. Β

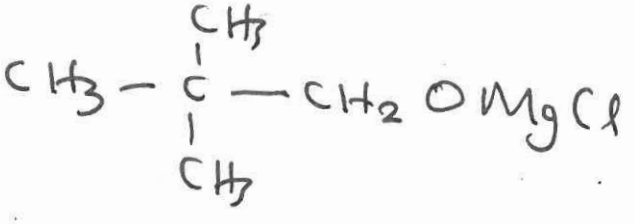
A_5. 1. Σ 2. Λ 3. Λ 4. Λ 5. Σ

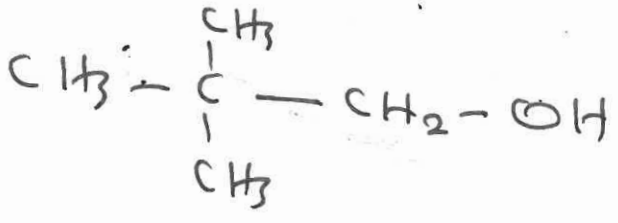
Γ1. A: 

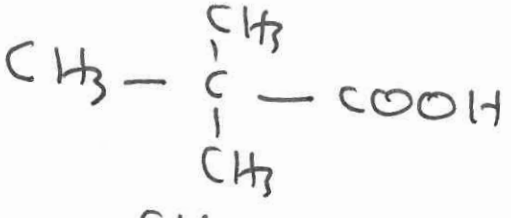
B: 

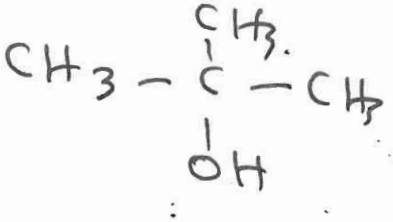
Γ: 

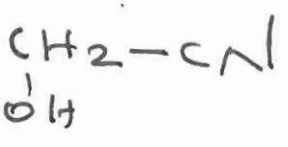
Δ: $CH_2=O$

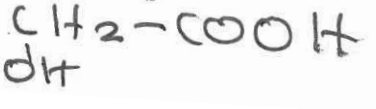
E: 

Z: 

Θ: 

K: 

Λ: 

M: 

Γ2. α) $n_{C_6H_5OH} = 0,1 \cdot V$ mol

$n_{CH_3CH_2OH} = 0,1 \cdot V$ mol

Εξουδετερώνεται μόνο η φαινόλη

$C_6H_5OH + NaOH \longrightarrow C_6H_5ONa + H_2O$

0,1V mol 0,1V mol 0,1V mol

$n_{NaOH} = 1 \cdot 0,01 = 0,01$ mol,

Αρα ισχύει: $0,1V = 0,01 \Rightarrow V = 0,1$ L

ή $\boxed{V = 100 \text{ mL}}$

β) Το Υ3 περιέχει 0,01 mol C_6H_5ONa και 0,01 mol CH_3CH_2OH $C_{C_6H_5ONa} = 0,1M$

Το pH θα καθορισθεί από το άλας C_6H_5ONa

(M)	$C_6H_5ONa \longrightarrow$	$C_6H_5O^-$	+ Na^+
Διάσταση	0,01	—	—
Παρ	—	0,01	0,01

Ιοντισμός $C_6H_5O^-$

(M)	$C_6H_5O^- + H_2O \rightleftharpoons$	C_6H_5OH	+ OH^-
αρχικά	0,01	—	—
ιοντίζονται	x	—	—
Παράγονται	—	x	x

Τελικά $[C_6H_5O^-] = 0,01 - x \approx 0,01$ M

$[C_6H_5OH] = (OH^-) = x$ M

$K_b(C_6H_5O^-) = \frac{K_w}{K_a} = \frac{10^{-14}}{10^{-10}} = 10^{-4}$

Νόμος Ι.Ι. για το $C_6H_5O^-$

$$K_b = \frac{[C_6H_5OH]\,(OH^-)}{[C_6H_5O^-]} \Rightarrow 10^{-4} = \frac{x^2}{0,01} \Rightarrow$$

$$\Rightarrow \quad x = 10^{-3}$$

Άρα $(OH^-) = 10^{-3}\ M$

$$[H_3O^+] = \frac{10^{-14}}{10^{-3}} = 10^{-11}\ M \Rightarrow \boxed{pH = 11}$$

Γ3. 1-προπανόλη $CH_3CH_2CH_2OH$

2-προπανόλη $CH_3\underset{\underset{OH}{|}}{C}HCH_3$

αιθυλομεθυλαιθέρας $CH_3CH_2OCH_3$

2-προπεν-1-όλη $CH_2=CH-CH_2OH$

Δοχεία	Na	Br_2/CCl_4	$I_2/NaOH$
1	+	−	−
2	−	−	−
3	+	+	−
4	+	−	+

Ένωση	Na	Br_2/CCl_4	$I_2/NaOH$
$CH_3CH_2CH_2OH$	+	−	−
$CH_3\underset{\underset{OH}{|}}{C}HCH_3$	+	−	+
$CH_3CH_2OCH_3$	−	−	−
$CH_2=CH-CH_2OH$	+	+	−

Συμπέρασμα

Δοχεία	Ένωση
1	$CH_3CH_2CH_2OH$
2	$CH_3CH_2OCH_3$
3	$CH_2=CH-CH_2OH$
4	$CH_3-\underset{OH}{CH}-CH_3$

Αντιδράσεις

$$CH_3CH_2CH_2OH + Na \longrightarrow CH_3CH_2CH_2ONa + \tfrac{1}{2}H_2\uparrow$$

$$CH_3-\underset{OH}{CH}-CH_3 + Na \longrightarrow CH_3-\underset{ONa}{CH}-CH_3 + \tfrac{1}{2}H_2\uparrow$$

$$CH_2=CH-CH_2OH + Na \longrightarrow CH_2=CH-CH_2ONa + \tfrac{1}{2}H_2\uparrow$$

$$CH_2=CH-CH_2OH + Br_2 \xrightarrow{CCl_4} \underset{Br}{CH_2}-\underset{Br}{CH}-CH_2OH$$

$$CH_3-\underset{OH}{CH}-CH_3 + 4I_2 + 6NaOH \longrightarrow CH_3COONa + CHI_3\downarrow + 5NaI + 5H_2O$$