

QUESTION	Answer content	POINT
QUESTION 1		2
	1) 6-ethyl-3-methyloctan-4-ol; 2) 6-hydroxyoctanal	0,25 0,25
	3) acid 6-methyloctanoic 4) 6-ethyloctan-3-on	0,25 0,25
	5) 5-(N-methylamino)-2-methylheptan (or 5-(N-methyl) -2-methylheptanamin)	0,25
	6) 3-ethyl-1-hydroxy-5-methylbenzen.	0,25
	7) 1-formyl-2-methylcyclohexan (or 2-methylcyclohexan-1-carbaldehyd)	0,25
	8) 2-ethylpentanoyl clorua	0,25
QUESTION 2		2
	(A) CH ₃ CH=CHCH ₃	0,25
	(B) CH ₃ CH=O	0,25
	(C) (CH ₃) ₂ CH-CH(OH)-CH ₃	0,25
	(D) HCl or SOCl ₂ or PCl ₃ or PCl ₅ ...	0,25
	(E) (CH ₃) ₂ CH-CH(CH ₃)-COOH	0,25
	(F) (CH ₃) ₂ CH-CH(CH ₃)-CO-Cl	0,25
	(G) (CH ₃) ₂ CH-CH(CH ₃)-CO-OCH ₃	0,25
.....	(H) (CH ₃) ₂ CH-CH(CH ₃)-CH ₂ OH ; (I): HOCH ₃	0,25
QUESTION 3	(1) : Br ₂ , ánh sáng	2
	(A) CH ₃ CH ₂ CH ₃ CH(Br)-C ₆ H ₅	0,2
	(2) : OH ⁻ /H ₂ O	0,2
	(B) CH ₃ CH ₂ CH ₃ CH(OH)-C ₆ H ₅	0,2
	(C) CH ₃ CH ₂ CH ₃ -CO-C ₆ H ₅	0,2
	(3) : Br ₂ , Fe, hay Al, hay FeBr ₃	0,2
	(D) para_ CH ₃ CH ₂ CH ₃ CH ₂ -C ₆ H ₄ - Br (If ortho still points)	0,2
	(4) : OH ⁻ /C ₂ H ₅ OH	0,2
	(E) CH ₃ CH ₂ CH=CH-C ₆ H ₅	0,2
	(5) : Br ₂	0,2
.....	(G) CH ₃ CH ₂ CHBrCHBr-C ₆ H ₅	0,2
QUESTION 4	a) Synthetic acetic acid (0,5 points)	2
	$2\text{CH}_4 \xrightarrow[1.l. nhanh]{1500^\circ\text{C}} \text{C}_2\text{H}_2 \xrightarrow[\text{HgSO}_4, \text{H}^+]{\text{H}_2\text{O}} \text{CH}_3\text{CH}=\text{O} \xrightarrow[\text{Mn}^{+2}]{\text{O}_2} \text{CH}_3\text{-COOH}$ <p>Students can do otherwise, if true for maximum score.</p>	0,5
	b) Synthetic propyl alcohol (1,25 points)	1,25
	$\text{C}_2\text{H}_2 \xrightarrow{\text{H}_2, \text{Ni}} \text{CH}_3\text{-CH}_3 \xrightarrow{\text{Cl}_2, \text{as}} \text{CH}_3\text{CH}_2\text{-Cl} \xrightarrow{\text{KCN}} \text{CH}_3\text{CH}_2\text{CN}$ $\xrightarrow{2\text{H}_2\text{O} (\text{H}^+)} \text{CH}_3\text{CH}_2\text{COOH} \xrightarrow{\text{LiAlH}_4} \text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$ <p>Sinh viên có thể làm theo cách khác nếu đúng cho điểm tối đa</p>	

	c) Esterification reaction (0,25 points)	0,25
	$\text{CH}_3\text{COOH} + \text{C}_2\text{H}_5\text{-CH}_2\text{OH} \xrightleftharpoons{\text{H}^+} \text{CH}_3\text{COO-CH}_2\text{C}_2\text{H}_5 + \text{H}_2\text{O}$	
QUESTION 5		2
a.	<p>It can not be used because in alkaline environments aldohexozo and xetohexozo can be mutually transformed through enol generation so they can form groups so they are involved in silver-coated reactions.</p> <p>The diagram illustrates the mutarotation of D-glucose. On the left is the cyclic hemiacetal form (Haworth projection). In the middle is the open-chain form. On the right is the enediol intermediate. Below this, the open-chain form reacts with two equivalents of Tollens' reagent, $[\text{Ag}(\text{NH}_3)_2]^+ \text{OH}^-$, to form gluconic acid (shown as COONH_4), silver metal (2Ag), ammonia (3NH_3), and water (H_2O).</p>	<p>- Theoretical 0.5 point - Chemical equation: 0.5 point</p>
b.	<p>b1) - Ion balance of phenylalanine</p> <p>b2) - Calculating isoelectric point $\text{pH}_I = \frac{1}{2}(\text{pK}_1 + \text{pK}_2) = \frac{1}{2}(2,58 + 9,24) = 5,91$</p>	<p>- Write balanced equilibrium equation 0,5 points</p> <p>- Calculate pH_I: 0.5 point</p>
	TOTAL SCORE	10

Head of division

Lecturers

Tran Nguyen Minh An

Nguyen Van Boi

QUESTION	Answer content	POINT
QUESTION 1		<u>2</u>
	1. 5,7-dimethyloctan-1-ol	0,25
	2. 5-cloro-7-methyloctan-2-on	0,25
	3. 3-bromo-5-methyloctanal	0,25
	4. 5-amino-2-methyloctanoyl chloride	0,25
	5. acid 3,5-dimethylheptanoic	0,25
	6. 5-methylhexanamid	0,25
	7. acid 4-hydroxybenzen-1-carboxylic	0,25
.....	8. 1-amino-2-bromo-4-methylpentan (or 2-bromo-4-methylpentan-1-amin)	0,25
QUESTION 2		<u>2</u>
	(A) CH ₃ CH ₂ OH	0,25
	(B) CH ₃ CH ₂ -Br	0,25
	(C) CH ₃ CH ₂ -MgBr	0,25
	(D) CH ₃ CH ₂ CH ₂ CH ₂ OH	0,25
	(E) CH ₃ CH ₂ CH ₂ -COOH	0,25
	(F) (P ₂ O ₅)	0,25
	(G) CH ₃ CH ₂ CH ₂ COOCH ₃	0,25
.....	(H) CH ₃ CH ₂ CH ₂ CO-NHCH ₃	0,25
QUESTION 3		<u>2.</u>
	(A) CH ₃ CH ₂ CHBr-C ₆ H ₅	0,25
	(B) CH ₃ CH=CH-C ₆ H ₅	0,25
	(C) +D CH ₃ CHO + C ₆ H ₅ -CHO	0,25
	(E) C ₆ H ₅ -COOH	0,25
	(F) para- CH ₃ CH ₂ CH ₂ -C ₆ H ₄ .NO ₂	0,25
	(F) para- CH ₃ CH ₂ CH ₂ -C ₆ H ₄ .NH ₂	0,25
	(G) [para- CH ₃ CH ₂ CH ₂ -C ₆ H ₄ .N ₂ ⁽⁺⁾]Cl ⁽⁻⁾	0,25
.....	(H) para-CH ₃ CH ₂ CH ₂ -C ₆ H ₄ -N = N-C ₆ H ₄ -N(CH ₃) ₂ - para'	0,25
QUESTION 4	a) Synthetic Acetic acid (0,5 points)	<u>2</u>
	$2\text{CH}_4 \xrightarrow[\text{l.l. nhanh}]{1500^\circ\text{C}} \text{C}_2\text{H}_2 \xrightarrow[\text{HgSO}_4, \text{H}^+]{\text{H}_2\text{O}} \text{CH}_3\text{CH}=\text{O} \xrightarrow[\text{Mn}^{+2}]{\text{O}_2} \text{CH}_3\text{-COOH}$	<u>0,5</u>
	b) Synthetic isoamylic alcohol (1,25 điểm)	0,5
	$\text{CH}_4 \xrightarrow[-\text{HCl}]{\text{Cl}_2, \text{h}\gamma} \text{CH}_3\text{Cl} \xrightarrow{\text{NaOH}} \text{CH}_3\text{OH} \xrightarrow[\text{hay Cu; CuO}]{\text{PCC}} \text{H-CH=O}$	

