higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE

CHEMISTRY N5

4 December 2023

This marking guideline consists of 8 pages.

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QUESTION 1

1.1 1.1.1 True,✓ they have the same molecular formula.✓

1.1.2 True,✓ the functional group participates in chemical reaction.✓

1.1.3 False,✓ it contains chlorine and fluorine atoms only.✓

1.1.4 True,✓ they differ only in the number of neutrons✓ **OR** they differ in mass number.

1.1.5 False,✓ the condensed formula of pentane is $CH3(CH_2)_3CH_3$✓ **OR** pentane has 5 carbon atoms, not six.

(5 × 2) (10)

1.2 1.2.1



1.2.2



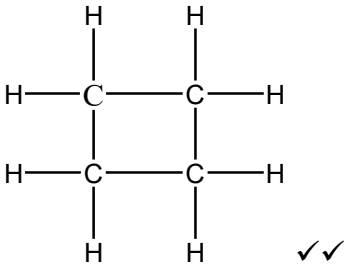
(2 × 2) (4)

1.3 Sp (1)

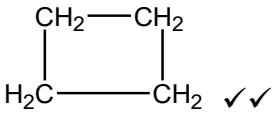
[15]

QUESTION 2: ALKANES

2.1



OR



C_4H_8 ✓ (4)

2.2 Pentane is non-polar, benzene is non-polar and polar.✓ Non-polar compounds✓ dissolve non-polar✓ compounds and polar compounds dissolve✓ polar compounds. (4)

2.3 4-ethyl-2,2-dimethyl hexane
√ √ √√ √ √ (3)

2.4
- Initiation
- Propagation
- Termination (3)

[13]

QUESTION 3: ALKENES

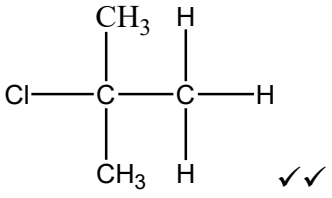
3.1
- 1-butene
- 2-butene
- Isobutene (3)

3.2 With the addition of a hydrogen halide√ to an unsymmetrical alkene,√ the hydrogen atom√ attaches to the less substituted√ carbon

OR

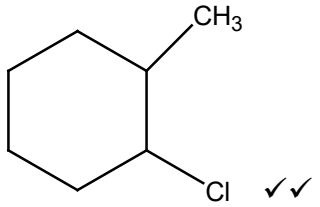
In the addition of a polar molecule√ to an unsymmetrical alkene,√ the hydrogen√ atom attaches itself to the carbon with the greater√ number of hydrogen atoms. (2)

3.3 3.3.1



✓✓

3.3.2



✓✓

(2 × 2) (4)

3.4 √ √ ✓ ✓

$$CH_3CH_2CH_2CHOHCH_3 \xrightarrow{H_2SO_4} CH_3CH_2CH_2CH{=}CH_2 + CH_3CH_2CH{=}CHCH_3$$

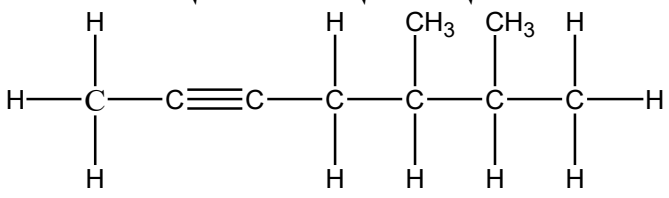
Minor product √ Major product √ (4)

[13]

QUESTION 4: ALKYNES

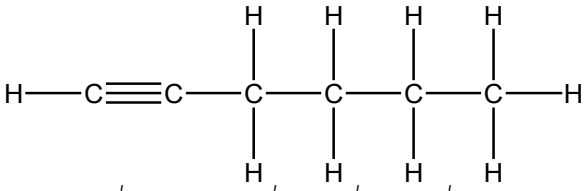
4.1 Structural formula of 5,6-dimethyl-2-heptyne .

√ √ √



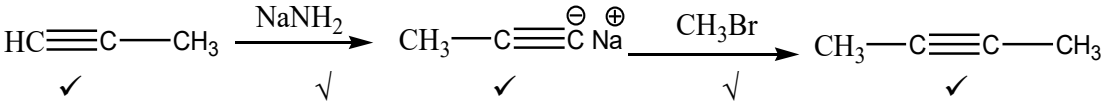
√ C_9H_{16}✓ (3)

4.2



√ √ √ √ 1- hexane✓ (3)

4.3



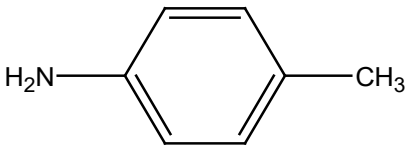
✓ √ ✓ √ ✓ (4)

[10]

QUESTION 5: AROMATIC COMPOUNDS

5.1 5.1.1

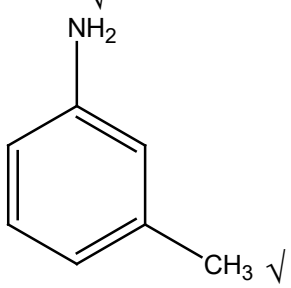
√ √√ √



p-amino toluene

5.1.2

√

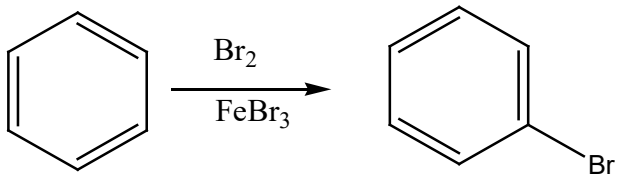


√

m-methylaniline

(2 × 2) (4)

5.2



✓ ✓ ✓ Bromobenzene✓ (4)

5.3 5.3.1 4-nitrotoluene ✓✓
OR 1-methyl-4-nitro benzene
OR p-nitrotoluene

5.3.2 1-bromo-3-nitrobenzene✓✓
OR m-nitro bromobenzene

(2 × 2) (4)
[12]

QUESTION 6: ALCOHOLS

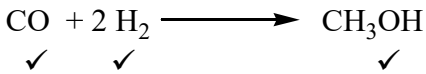
6.1 6.1.1 2-butanol✓
OR butan-2-ol ; secondary✓

6.1.2 2-methyl-2-butanol✓ ; tertiary✓

6.1.3 1-propanol✓
OR propan-1-ol ; primary✓

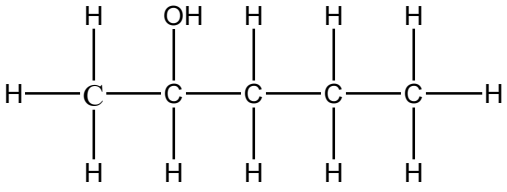
(3 × 2) (6)

6.2



✓ ✓ ✓ (3)

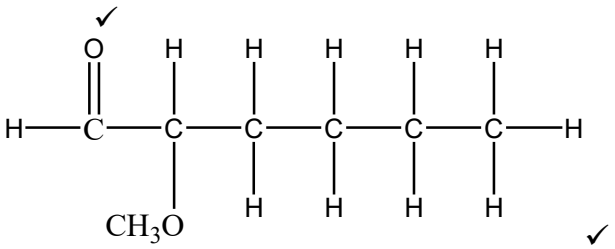
6.3



✓ 2-pentanol✓ **OR** pentan-2-ol
(2)
[11]

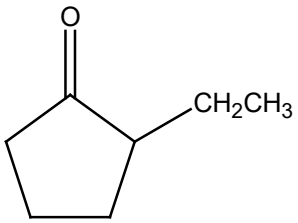
QUESTION 7: ALDEHYDES AND KETONES

7.1 7.1.1



✓ ✓ ✓ (3)

7.1.2

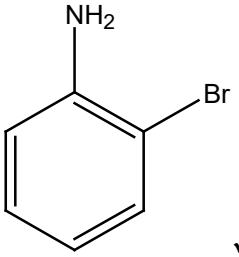


✓ ✓ ✓ (3)

7.2 Aldehyde✓; carboxylic acid✓ (2)
[8]

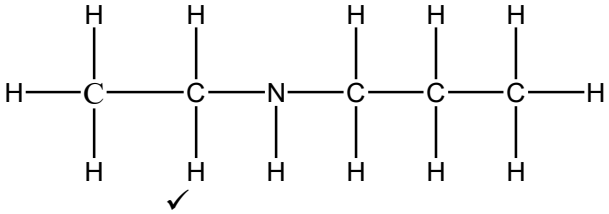
QUESTION 8: AMINES

8.1 8.1.1



✓ Primary✓

8.1.2



✓ Secondary ✓ (2 × 2) (4)

8.2 $CH_3CH_2CH_2CH_2Cl + NH_3 \longrightarrow CH_3CH_2CH_2CH_2\overset{\oplus}{N}H_3\overset{\ominus}{Cl}$

✓ √ ✓

$CH_3CH_2CH_2CH_2\overset{\oplus}{N}H_3\overset{\ominus}{Cl} \xrightarrow{KOH} CH_3CH_2CH_2CH_2NH_2$

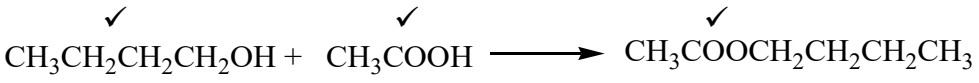
√ ✓ (4)
[8]

QUESTION 9: CARBOXYLIC ACIDS

9.1 9.1.1 Benzoic acid
9.1.2 Octanoic acid
9.1.3 2-chlorobutanoic acid

(3 × 2) (6)

9.2



Butyl ethanoate ✓
OR Butyl acetate (4)
[10]

TOTAL: 100

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