higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE

CHEMISTRY N5

25 November 2022

This marking guideline consists of 7 pages.

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QUESTION 1

1.1 1.1.1 False.✓ Propyne is unsaturated.√ It contains a triple bond.√

1.1.2 False.✓ Acyclic compounds are organic compounds in which the carbon atoms are arranged in open√ chains.√

1.1.3 True.✓ Methane has four single√ bonds bonded√ to hydrogen, making it sp^3.

1.1.4 True.✓ Acetone and propanal have the same√ molecular formula, but different√ structures.

1.1.5 True.✓ Boiling point increases√ with increase in carbon√ number.

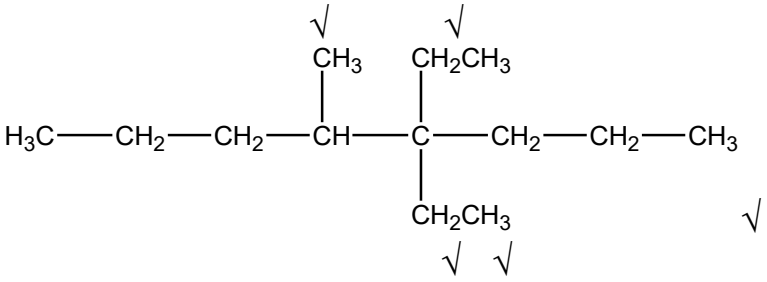
(5 × 2) (10)

1.2 A – Benzene ring
B – Amide
C – Carbonyl
D – Amine
E – Carboxylic

(5 × 1) (5)
[15]

QUESTION 2: ALKANES

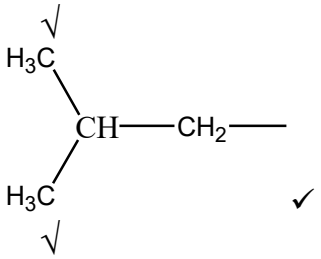
2.1 2.1.1



(3)

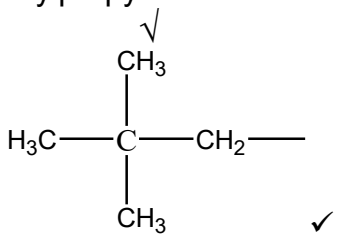
2.1.2 $C_{13}H_{28}$✓ (1)

2.2 2.2.1 Isopropyl



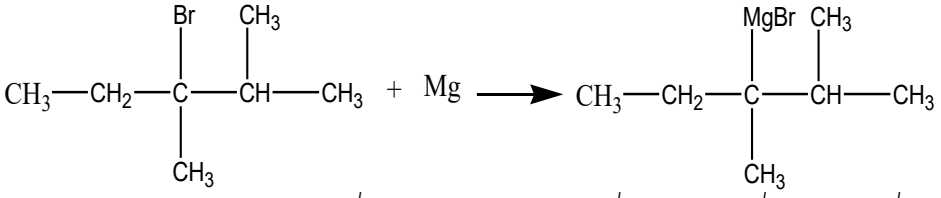
(2)

2.2.2 Neopentyl or 2,2-dimethylpropyl



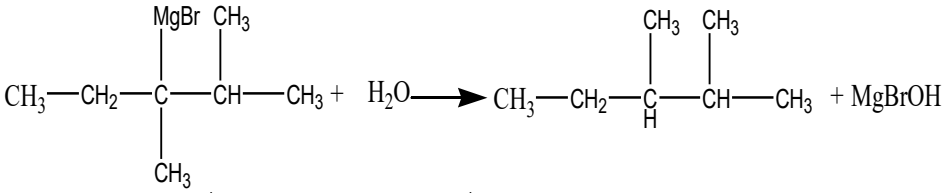
√ ✓ √ (2)

2.3 2.3.1



✓ √ √ √ √ (3)

2.3.2



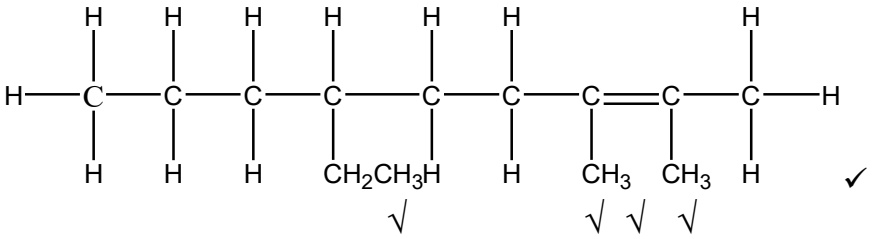
√ √ ✓ (2)

2.3.3 2,3√-dimethylpentane√ (1)

[14]

QUESTION 3: ALKENES

3.1

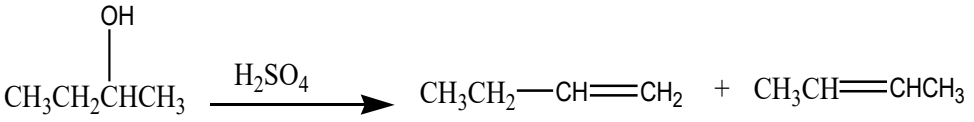


√ √ √ √ ✓ (3)

3.2 3.2.1 Saytseff's rule: In an elimination√ reaction,√ the alkene√ with the greatest√ number of alkyl√ substituents predominates√ (that is, the most highly substituted alkenes).

Alternative answer: When two alkenes√ can form from a single alcohol, the alkene√ that predominates√ is the one with the most√ alkyl substituents√ on the double√ bond. (3)

3.2.2

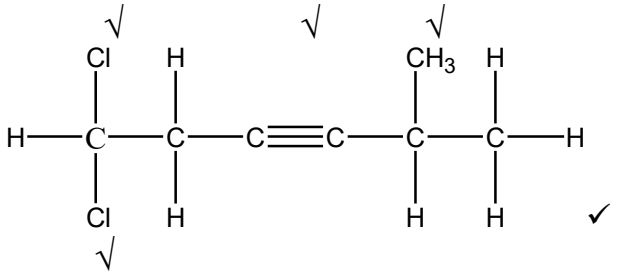


Minor product 1-butene √ Major product 2-butene √ (4)

[10]

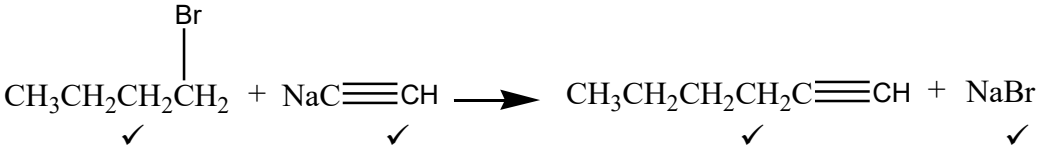
QUESTION 4: ALKYNES

4.1 Structural formula of 1,1-dichloro-5-methyl-3-hexyne.



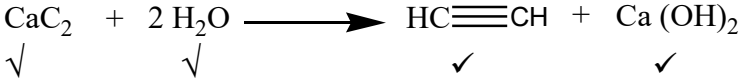
(3)

4.2



(4)

4.3

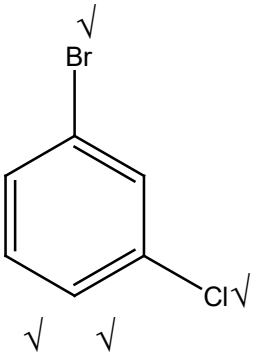


Ethyne/acetylene ✓ (4)

[11]

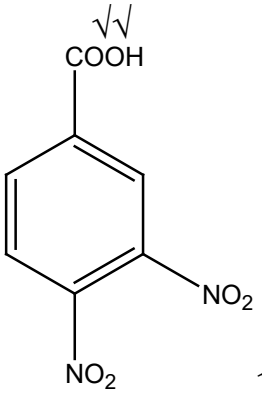
QUESTION 5: AROMATIC COMPOUNDS

5.1 5.1.1



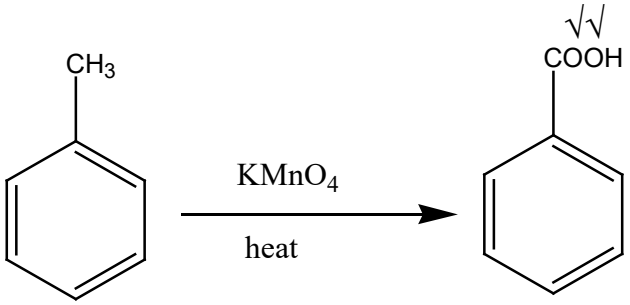
m-bromochlorobenzene (2)

5.1.2



3,4-dinitrobenzoic acid (3)

5.2



Benzoic acid √√ (2)

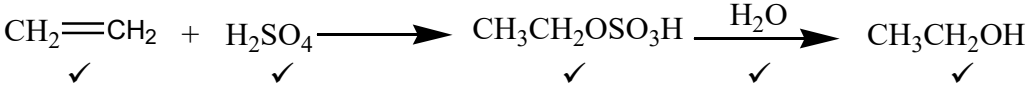
5.3 Nitration✓✓ (2)

5.4 sp^2✓ (1)

[10]

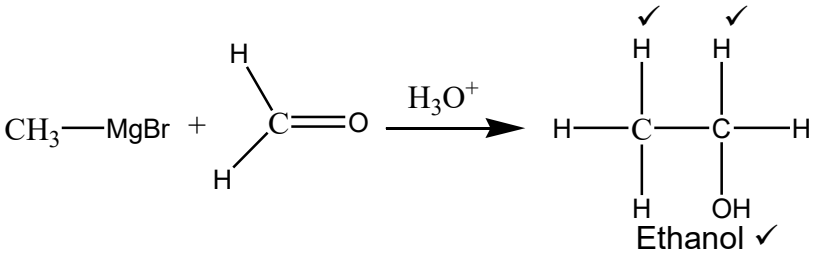
QUESTION 6: ALCOHOLS

6.1



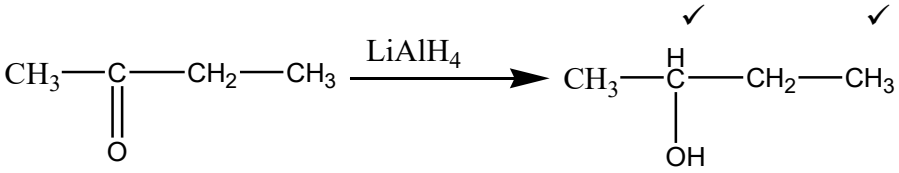
(5)

6.2 6.2.1



Ethanol ✓ (3)

6.2.2



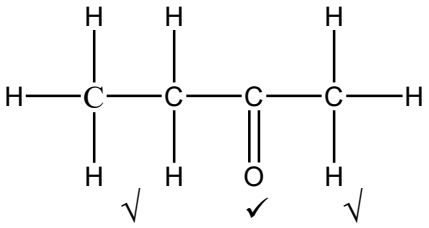
2-butanol✓ (3)

[11]

QUESTION 7: ALDEHYDES AND KETONES

7.1 Acetone✓ (1)

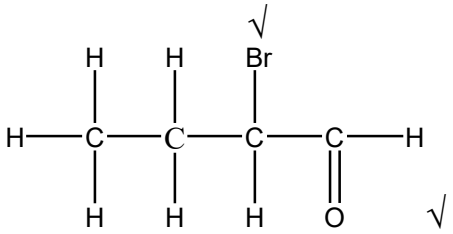
7.2 7.2.1



√ ✓ √

Ethyl methyl ketone

7.2.2

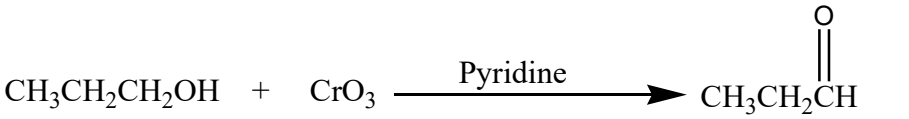


√

2-bromobutanal ✓

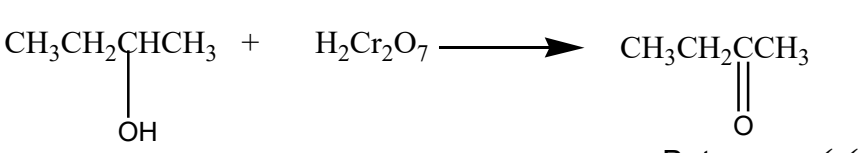
(2 × 2) (4)

7.3 7.3.1



Propanal ✓✓

7.3.2



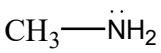
Butanone ✓✓

(2 × 2) (4)

[9]

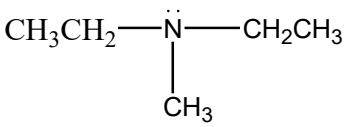
QUESTION 8: AMINES

8.1 8.1.1



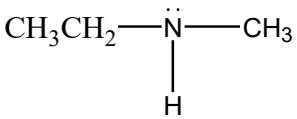
Methyl amine✓ Primary amine✓

8.1.2



Diethyl methyl amine✓ Tertiary amine✓

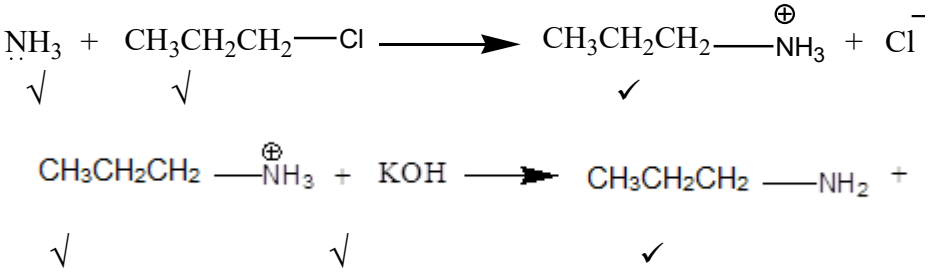
8.1.3



Ethyl methyl amine✓ Secondary amine✓

(3 × 2) (6)

8.2



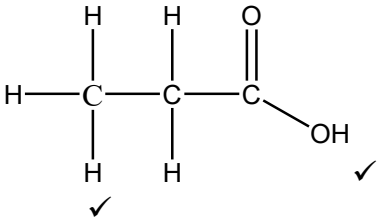
(4)

8.3 Amines can be classified as Lewis bases because they can donate✓ a pair√ of electrons.√
Alternative answer: Amines can be classified as Lewis bases because they have a lone/free√ pair√ of electrons√ that they can give away.√ (2)

[12]

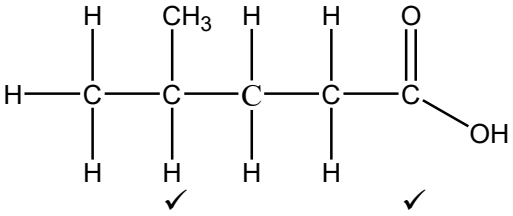
QUESTION 9: CARBOXYLIC ACIDS

9.1 9.1.1



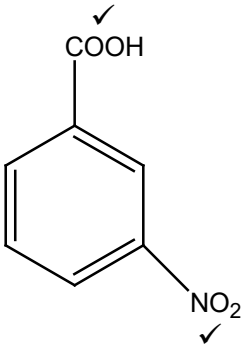
Propanoic acid

9.1.2



4-methyl pentanoic acid

9.1.3



m-nitrobenzoic acid

(3 × 2) (6)

9.2 Methyl methanoate or methyl formate✓✓ (2)

[8]

TOTAL: 100

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