



higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE

CHEMISTRY N5

9 APRIL 2019


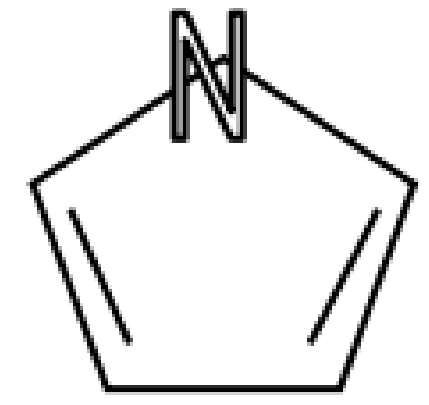
This marking guideline consists of 6 pages.

QUESTION 1: INTRODUCTION TO ORGANIC CHEMISTRY AND ALKANES

- 1.1 1.1.1 Reaction 1 (1)
- 1.1.2 Radicals (1)
- 1.1.3 H_3O^+ (1)
- 1.1.4 An electrophile is a substance that accepts a pair of electrons from the nucleophile in a polar bond-forming reaction. (2)
- 1.1.5 $\text{CH}_4 + \text{Cl}_2 \xrightarrow{\text{light}} \text{CH}_3\text{Cl} + \text{HCl}$ (4)
- 1.1.6 Substitution reaction – it is a reaction in which atoms or some parts of a molecule are replaced by another atoms or parts. (2)

OR

- In substitution reactions reactants exchange parts to form new products. (2)
- 1.1.7 It is a type of bond cleavage that occurs in polar reactions where each fragment leaves with both of the bonding electrons. (2)
- 1.2 1.2.1 C1: Sp^3 hybrid
C4: Sp^3 hybrid (2)
- 1.2.2 Unsaturated – it contains a double bond. (2)

- 1.3 1.3.1  (1)
- 1.3.2 $\text{CH}_3(\text{CH}_2)_3\text{CH}_3$ (1)
- 1.3.3  (1)

NOTE: Any acceptable example of an aromatic, aliphatic or heterocyclic compound should be awarded a mark.

(3 × 1) (3)
[20]

QUESTION 2: ALKENES, ALKYNES AND AROMATIC COMPOUNDS

2.1 2.1.1 C_nH_{2n+2} (1)

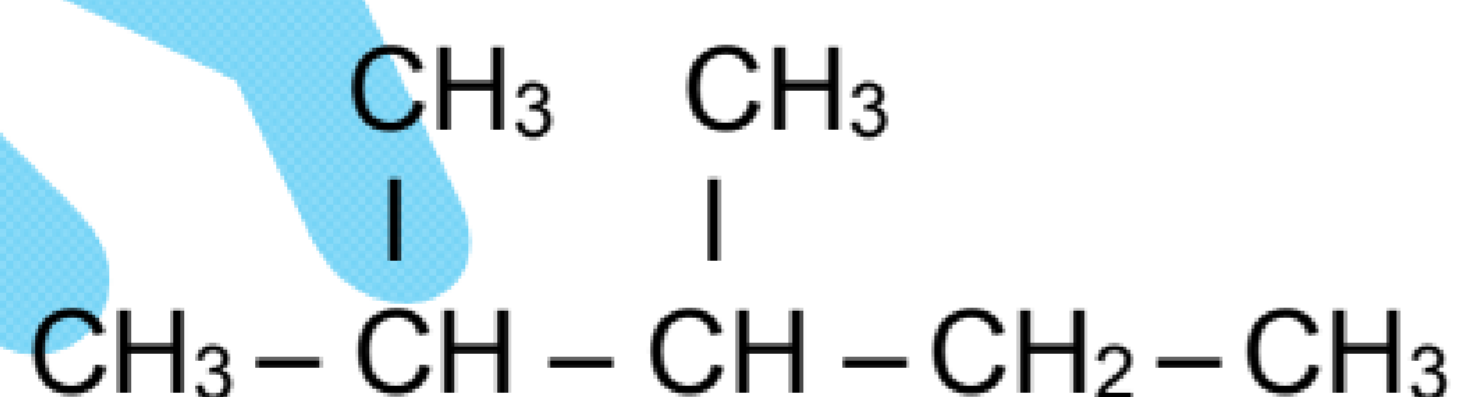
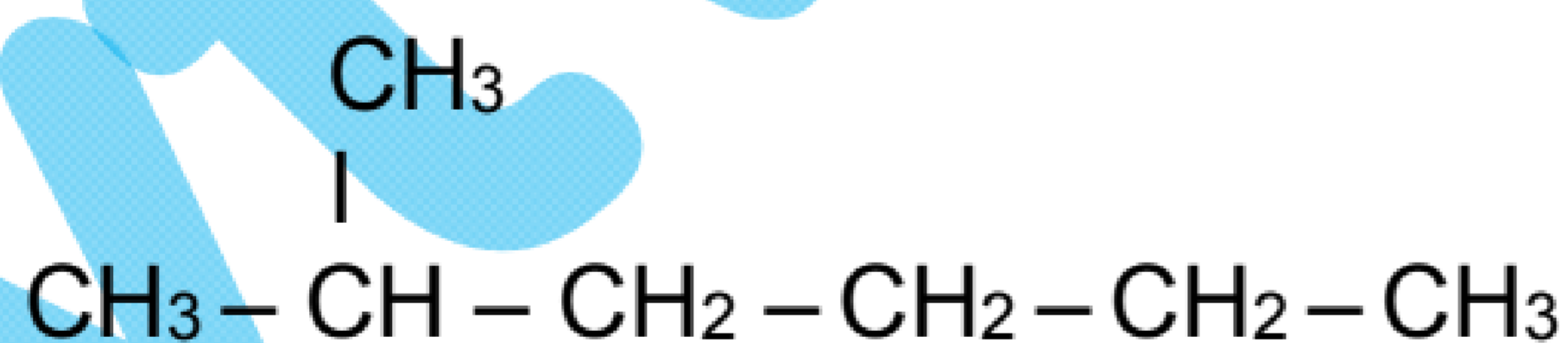
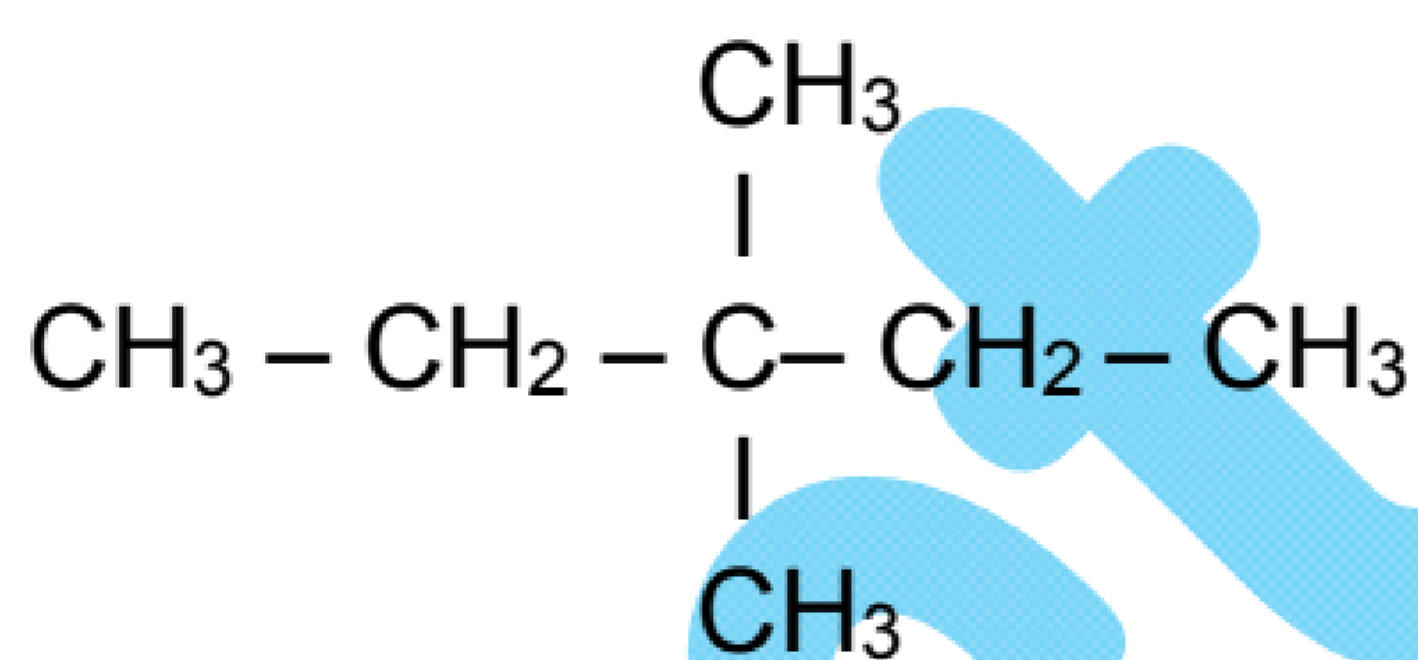
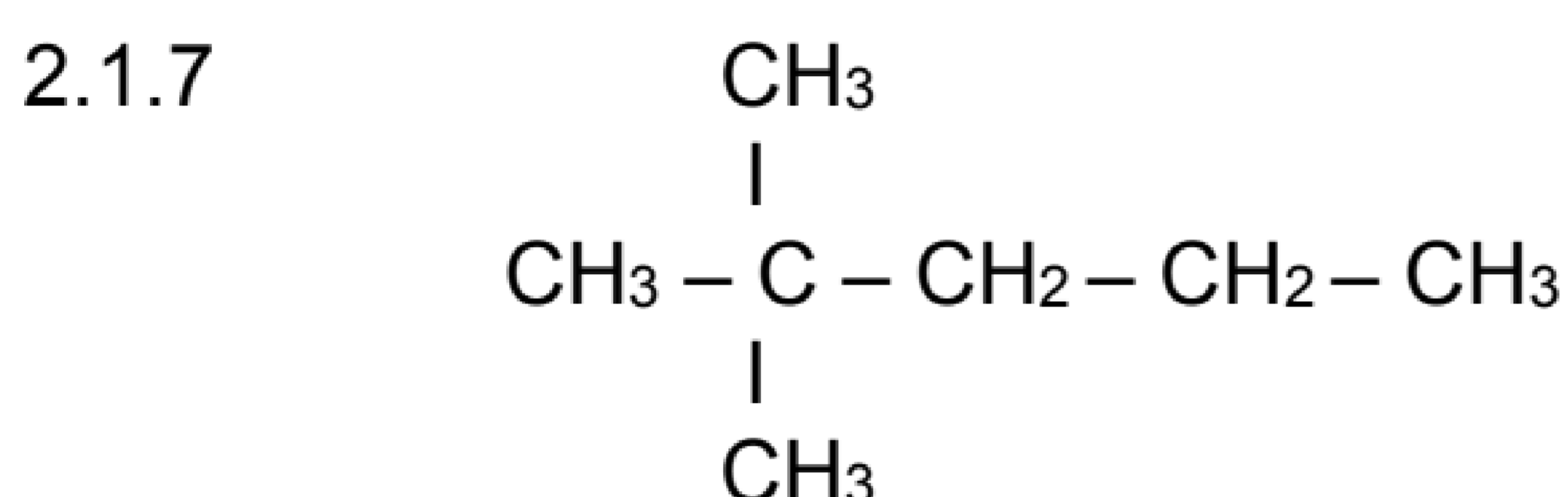
2.1.2 CH_3CH_3 (1)

2.1.3 None (1)

2.1.4 All three compounds are nonpolar, ✓ because alkanes are classified as nonpolar compounds. ✓ (2)

2.1.5 Pentane (2)

2.1.6 C_5H_{12} (1)



(Any 2 × 2) (4)

2.2 2.2.1 During the addition of HX to an alkene, the H attaches to the carbon with fewer alkyl substituents and the X attaches to the carbon with more alkyl substituents. (2)

2.2.2

- Major product: 1-bromo-1-methylcyclohexane
- Minor product: 2-bromo-1-methylcyclohexane (2 + 2) (4)