Of course! Here are 50 multiple-choice questions based on the "Unsaturated Hydrocarbons" PDF you provided. Each question includes four options, the correct answer, and the source reference from the document.

1. Which of the following describes an unsaturated hydrocarbon?

A) Contains only carbon-carbon single bonds 1

B) Contains carbon-carbon double or triple bonds 2

C) Is less dense than water 3

D) Is soluble in water 4

Correct Answer: B

**Reference:** 5

2. What is the general formula for an alkene with one double bond?

A) Cn H2n+2

B)

Cn H2n 6

C)

Cn H2n−2 7

D) Cn Hn

Correct Answer: B

**Reference:** 8

3. According to IUPAC nomenclature, what is the first step in naming an alkene?

A) Number the chain from the end closest to a substituent

B) Identify and name the longest continuous chain of carbon atoms that contains the double bond 9

C) Locate and name all attached groups 10

D) Combine the names into a single word 11

Correct Answer: B

**Reference:** 12

4. In a cycloalkene, what number must be assigned to one of the carbons of the double bond?

A) The highest possible number

B) Any number is acceptable

C) The number "1" 13

D) The number "0"

Correct Answer: C

**Reference:** 14

5. Carbon atoms involved in a carbon-carbon double bond exhibit which type of hybridization?

A) sp

B)

sp2 15

C) sp3

D) sp4

Correct Answer: B

**Reference:** 16

6. What is the bond angle around an sp2 hybridized carbon atom?

A) 90∘

B) 109.5∘

C)

120∘ 17

D)

180∘ 1818

Correct Answer: C

**Reference:** 19

7. A carbon-carbon double bond consists of which types of bonds?

A) Two σ-bonds

B) Two π-bonds

C) One σ-bond and one π-bond 20

D) One σ-bond and two π-bonds

Correct Answer: C

**Reference:** 21

8. Why is free rotation not possible around a carbon-carbon double bond?

A) Due to the strength of the σ-bond

B) Due to the presence of the π-bond 22

C) Due to the trigonal planar shape 23

D) Due to the nonpolar nature of the molecule 24

Correct Answer: B

**Reference:** 25

9. The prefix cis- is used in geometric isomers when the arms of the longest chain are on:

A) Opposite sides of the double bond 26

B) The same side of the double bond 27

C) Perpendicular sides of the double bond

D) The same carbon atom

Correct Answer: B

**Reference:** 28

10. Which important alkene is used to stimulate the ripening process in plants?

A) Propylene 29

B) Vinyl chloride 30

C) Ethylene 31

D) Tetrachloroethylene 32

Correct Answer: C

**Reference:** 33

11. The red pigment found in tomatoes and watermelon is known as:

A) Zeaxanthin 34

B) Astaxanthin 35

C) Lycopene 36

D) β-carotene 37

Correct Answer: C

**Reference:** 38

12. Terpenes are a diverse group of molecules synthesized from which repeating unit?

A) Ethylene 39

B) Isoprene 40

C) Propylene 41

D) Benzene 42

Correct Answer: B

**Reference:** 43

13. In the chemistry of vision, a photon of light causes cis-retinal to change into what form?

A) trans-retinal 44

B) Vitamin A 45

C) β-carotene 46

D) Rhodopsin 47

Correct Answer: A

**Reference:** 48

14. Which statement accurately describes the physical properties of alkenes?

A) They are polar and soluble in water

B) They are nonpolar and insoluble in water 49

C) They are denser than water 50

D) They are always gases at room temperature

Correct Answer: B

**Reference:** 51

15. Most reactions of alkenes are classified as what type of reaction?

A) Substitution reactions 52

B) Elimination reactions

C) Addition reactions 53

D) Oxidation reactions

Correct Answer: C

**Reference:** 54

16. What is the product when an alkene undergoes a halogenation reaction with Br2 ?

A) An alkane

B) An alcohol 55

C) An alkyl halide 56

D) A diene

Correct Answer: C

**Reference:** 57

17. The hydrogenation of an alkene to form an alkane requires the presence of what?

A) A strong acid catalyst like

H2 SO4 58

B) Molecular bromine (

Br2 ) 59

C) A metal catalyst, usually Pt 60

D) Water 61

Correct Answer: C

**Reference:** 62

18. According to Markovnikov's Rule, when H-X adds to a double bond, the hydrogen attaches to the carbon atom that:

A) Is already bonded to the most hydrogen atoms 63

B) Is bonded to the fewest hydrogen atoms

C) Is part of the longest chain

D) Has the highest atomic mass

Correct Answer: A

**Reference:** 64

19. What is the product of a hydration reaction of an alkene?

A) An ether

B) An aldehyde

C) An alkane 65

D) An alcohol 66

Correct Answer: D

**Reference:** 67

20. Long, chain-like organic molecules built from simpler subunits are called:

A) Monomers 68

B) Isomers

C) Polymers 69

D) Allotropes

Correct Answer: C

**Reference:** 70

21. Polyvinyl chloride (PVC) is a polymer made from which monomer?

A) Ethylene 71

B) Propene 72

C) Styrene 73

D) Chloroethene (vinyl chloride) 74

Correct Answer: D

**Reference:** 75

22. Which polymer is known for its use in nonstick coatings?

A) Polyethylene 76

B) Polystyrene 77

C) Teflon 78787878

D) Polypropylene 79

Correct Answer: C

**Reference:** 80808080

23. Natural rubber is a polymer of which monomer?

A) Chloroprene 81

B) Isoprene 82828282

C) Butadiene 83

D) Styrene 84

Correct Answer: B

**Reference:** 85858585

24. What is the suffix used to indicate a triple bond in an alkyne?

A) -ane

B) -ene 86

C) -yne 87

D) -ol

Correct Answer: C

**Reference:** 88

25. Carbon atoms involved in a carbon-carbon triple bond exhibit which type of hybridization?

A) sp 89

B)

sp2 90

C) sp3

D) s

Correct Answer: A

**Reference:** 91

26. What is the geometry and bond angle around the carbon atoms in acetylene?

A) Trigonal planar, 120∘

B) Tetrahedral, 109.5∘

C) Linear,

180∘ 92929292

D) Bent, 120∘

Correct Answer: C

**Reference:** 93939393

27. A carbon-carbon triple bond consists of:

A) One σ-bond and one π-bond

B) Three σ-bonds

C) Three π-bonds

D) One σ-bond and two π-bonds 94

Correct Answer: D

**Reference:** 95

28. Aromatic compounds are defined as those that contain:

A) A carbon-carbon triple bond 96

B) A long chain of carbon atoms

C) A benzene ring or its structural relatives 97

D) Only single bonds 98

Correct Answer: C

**Reference:** 99

29. The two Kekulé structures for benzene are examples of:

A) Geometric isomers 100

B) Structural isomers

C) Resonance structures 101

D) Stereoisomers

Correct Answer: C

**Reference:** 102

30. What is the hybridization of all six carbon atoms in the benzene ring?

A) sp

B)

sp2 103

C) sp3

D) Unhybridized

Correct Answer: B

**Reference:** 104

31. When a benzene ring is named as a substituent, what is it called?

A) Benzyl group

B) Phenyl group 105

C) Toluene group

D) Aniline group

Correct Answer: B

**Reference:** 106

32. Which common name refers to methylbenzene?

A) Phenol 107

B) Aniline 108

C) Toluene 109

D) Benzoic acid 110

Correct Answer: C

**Reference:** 111

33. In a disubstituted benzene ring, what does the prefix ortho- signify?

A) Substituents at positions 1 and 2 112

B) Substituents at positions 1 and 3 113

C) Substituents at positions 1 and 4

D) Substituents on opposite sides of the ring

Correct Answer: A

**Reference:** 114

34. The major reaction of interest for aromatic compounds is:

A) Addition 115

B) Halogenation 116

C) Substitution 117

D) Hydration 118

Correct Answer: C

**Reference:** 119

35. 2,4,6-trinitrotoluene is the chemical name for which powerful explosive?

A) Nitroglycerin 120

B) Dynamite 121

C) TNT 122

D) C-4

Correct Answer: C

**Reference:** 123

36. The pungent, hot component of ginger is a vanilloid called:

A) Vanillin 124

B) Benzaldehyde 125

C) Zingerone 126

D) Cinnamaldehyde 127

Correct Answer: C

**Reference:** 128

37. Which aromatic compound is found in oil of cinnamon?

A) Eugenol 129

B) Anethole 130

C) Benzyl acetate 131

D) Cinnamaldehyde 132

Correct Answer: D

**Reference:** 133

38. Tetrahydrocannabinol (THC) is the active component of which substance?

A) Willow bark 134

B) Roses 135

C) Cannabis 136

D) Peanuts 137

Correct Answer: C

**Reference:** 138

39. Polycyclic aromatic hydrocarbons (PAH) consist of two or more fused:

A) Cyclohexane rings

B) Alkyne chains

C) Benzene rings 139

D) Porphyrin rings

Correct Answer: C

**Reference:** 140

40. The large aromatic-like ring structure found in heme and chlorophyll is:

A) Naphthalene 141

B) Anthracene 142

C) Porphyrin 143

D) Pyridine 144

Correct Answer: C

**Reference:** 145

41. The metal ion at the center of the heme molecule in blood is:

A)

Mg2+ 146

B)

Fe2+ 147

C) Zn2+

D) Cu2+

Correct Answer: B

**Reference:** 148

42. What is the metal ion at the center of a chlorophyll molecule?

A)

Fe2+ 149

B)

Mg2+ 150

C) Mn2+

D) Ca2+

Correct Answer: B

**Reference:** 151

43. Which polymer is used to make indoor-outdoor carpets and sterilizable storage containers?

A) Polyethylene (PE) 152

B) Polyvinyl chloride (PVC) 153

C) Polypropylene (PP) 154

D) Polystyrene (PS) 155

Correct Answer: C

**Reference:** 156

44. Styrofoam is produced by polymerizing styrene in the presence of a:

A) Metal catalyst

B) Strong acid

C) Foaming agent 157

D) Dehydrating agent

Correct Answer: C

**Reference:** 158

45. What process, involving sulfur, is used to harden natural rubber?

A) Halogenation

B) Hydrogenation

C) Nitration

D) Vulcanization 159

Correct Answer: D

**Reference:** 160

46. Which of the following is an aliphatic compound?

A) Benzene 161

B) Toluene 162

C) Cyclohexane 163

D) Naphthalene 164

Correct Answer: C

**Reference:** 165

47. A molecule of 1,3-butadiene contains how many double bonds?

A) One

B) Two 166

C) Three 167

D) Four 168

Correct Answer: B

**Reference:** 169

48. In a disubstituted benzene ring, the prefix para- indicates that the substituents are at which positions?

A) 1,2

B) 1,3

C) 1,4 170

D) 1,5

Correct Answer: C

**Reference:** 171

49. The hydration of an unsymmetrical alkene, such as propene, primarily follows which rule?

A) Huckel's Rule

B) The Octet Rule

C) Markovnikov's Rule 172

D) Hund's Rule

Correct Answer: C

**Reference:** 173

50. What is the common name for the polymer poly(methyl methacrylate)?

A) Saran 174

B) Orlon 175

C) Neoprene 176

D) Plexiglass or Lucite 177

Correct Answer: D

**Reference:** 178