1. The product obtained from the reaction of cis-2-hexene and OsO₄/H₂O₂ is:
   a. meso-2,3-hexanediol  b. threo-2,3-hexanediol  c. erythro-2,3-hexanediol
d. racemic-1,2-hexanediol

2. The correct IUPAC name for
   a. 4-ethyl-hex-2-yne-5-ol  b. 5-(2-hydroxyethyl)-1-hex-2-yne
   c. 3-ethyl-hex-4-yne-2-ol  d. none of these

3. In the accepted mechanism of the reduction of an internal alkyne with Na/NH₃, which intermediate is formed when the alkyne reacts with an electron?
   a. free radical  b. radical-cation  c. radical anion  d. anion  e. cation

4. Which of the following conditions could be used to convert 2,3-dibromopentane to 2-pentyne?
   a. KOH (fused)/200°C  b. NaNH₂/150 °C  c. both a and b  d. none of these

5. What is the major organic product that results when 1-heptyne is treated with 2 equivalents of HI?
   a. 2,3-diido-1-heptene  b. 2,3-diido-2-heptene  c. 1,2-diidoheptane
d. 2,2-diidoheptyne  e. 1,1-diidoheptane

6. Which one of the following compounds is the strongest acid?
   a. 2,4-dinitrocyclohexanol  b. 4-nitrophenol  c. 4-methylphenol  d. phenol

7. Which reagents can be used to prepare erythro-3-bromo-2-butanol?
   a. cis-2-butene + Br₂/ HOH  b. trans-2-butene + Br₂/ HOH  c. both of these  d. none of these.

8. How many rings are present in a molecule, C₆H₆N₂ that reacts with 3 equivalents of H₂?
   a. two  b. three  c. four  d. five

9. 2-Butyne can be converted to erythro 3-bromobutan-2-ol in good yield by which of the following methods:
   a. Reduction of 2-butyne with Na/NH₃ followed by treatment with Br₂ in water.
b. Reduction of 2-butyne with H₂ in the presence of Lindlar catalyst followed by treatment with Br₂ in water
c. Reduction of 2-butyne with NaNH₂ followed by treatment with Br₂
d. Bromination of 2-butyne with two equiv of Br₂ followed by treatment with Lindlar catalyst and H₂

10. In a 1-butanol molecule, the hydrophilic part of the molecule is:
    a. the hydroxy group  b. the 4-carbon chain  c. none of these

11. Which of the isomeric butyl alcohols has the highest boiling point?
    a. n-butyl alcohol  b. sec-butyl alcohol  c. isobutyl alcohol  d. tert-butyl alcohol
12. The name of the following compound is?

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OH
Cl
Br
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a. 3-bromo-1-chlorophenol  b. 1-bromo-3-chloro-4-hydroxybenzene  c. 4-bromo-2-chlorophenol  d. none of these

13. Which one of the following terms best describes the reactive nature of an alkyllithium reagent?

a. carbocation  b. free radical  c. electrophile  d. nucleophile  e. carbene

14. 1,1-diphenylmethanol (Ph)2CHOH can be prepared by:

a. treatment of PhCHO + PhLi  b. PhCOOMe + PhLi  c. HCOOMe + PhLi  
d. a,b, and c  e. a and b  f. a and c

15. Which of the following are organometallic compounds.

a. CH3CH2ONa  b. CH3CH2Cs  c. CH3CH2Li  d. CH3CHSLi  e. both b and c

16. Which of the following reactions have flaws in Grignard syntheses.

THF

a. 3-hydroxycyclohexanone + PhMgBr → 3-hydroxy-1-phenylcyclohexanol

b. (Me)2NCH2CH2Br + Li → (Me)2NCH2CH2Li

MeOH
c. 1-MeO-3-iodobenzene + CH3Li → 1-MeO-3-methylbenzene
d. none of these  e. all of these

END OF GUESSES