



ORGANIC
PAST PAPERS
MID (MAKE UP) 2020/2021

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1) Which statement is NOT true for S_N1 reactions?

- a. Rate depends only on concentration of alkyl halide.
- b. It is fastest in polar protic solvents.
- c. Reaction occurs in one step.
- d. Reaction is slowest with primary halides.
- e. Reaction occurs with racemization of configuration.

2) Which nucleophile reacts with the following trans-halide to give a substitution product with cis-geometry ?



- a. NaCN
- b. ethanol
- c. CH₃OH
- d. H₂O

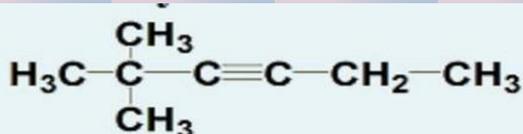
3) Which of the following is weakest acid?

- a. 3,3-dichloro-1-propanol
- b. 2-chloro-2-methyl-1-propanol
- c. 2,2-dichloro-1-propanol
- d. 3-chloro-2-methyl-1-propanol
- e. 2,2-dimethyl-1-propanol
- f. 2,2,3-trichloro-1-propanol

4) Which of the following undergoes dehydration fastest?

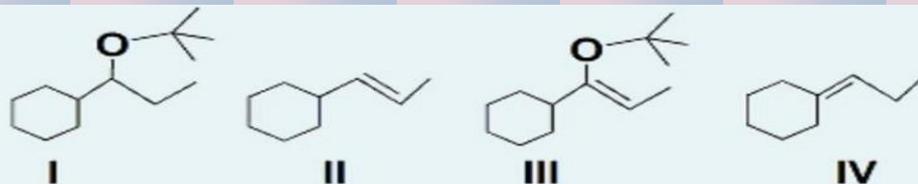
- a. ethanol
- b. 2-methyl-2-butanol
- C. 2-pentanol
- d. 2-methyl-1-butanol
- e. cyclohexanol

5) Which two starting materials would you need to prepare this compound?



- a. $\begin{array}{c} \text{CH}_3 \\ | \\ \text{HC}=\text{C}-\text{C}-\text{CH}_2\text{Br} \\ | \\ \text{CH}_3 \end{array}$ and $\text{HC}\equiv\text{CH}$
- b. $\begin{array}{c} \text{CH}_3 \\ | \\ \text{H}_3\text{C}-\text{C}-\text{Br} \\ | \\ \text{CH}_3 \end{array}$ and $\text{Br}-\text{C}\equiv\text{C}-\text{CH}_2\text{CH}_3$
- c. $\begin{array}{c} \text{CH}_3 \\ | \\ \text{H}_3\text{C}-\text{C}-\text{C}\equiv\text{CH} \\ | \\ \text{CH}_3 \end{array}$ and $\text{CH}_3-\text{CH}_2\text{Br}$
- d. $\begin{array}{c} \text{CH}_3 \\ | \\ \text{H}_3\text{C}-\text{C}-\text{Br} \\ | \\ \text{CH}_3 \end{array}$ and $\text{HC}\equiv\text{C}-\text{CH}_2\text{CH}_3$

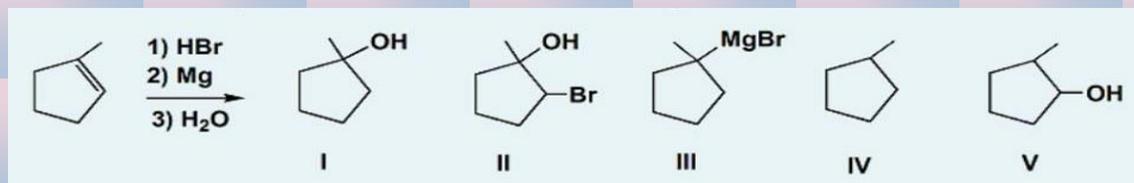
6) Which is the major product of the following reaction?



- a. IV

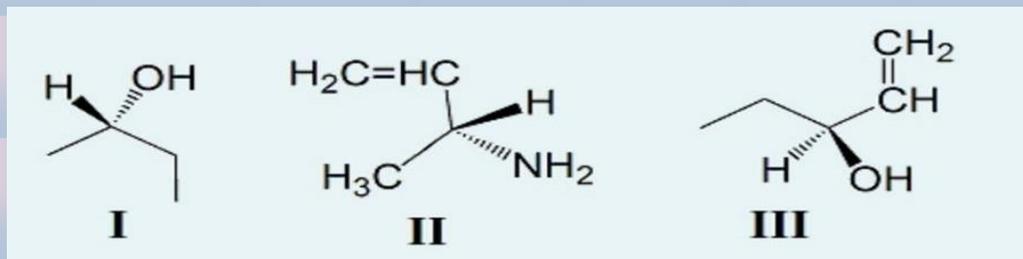
- b. II
- c. III
- d. I + III
- e. I

7) What is the product of the following reaction?



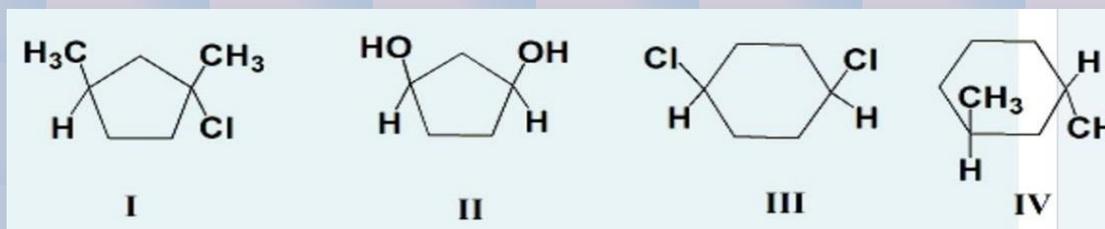
- a. IV
- b. I
- c. III
- d. II
- e. V

8) Which molecule has (S)-configuration?



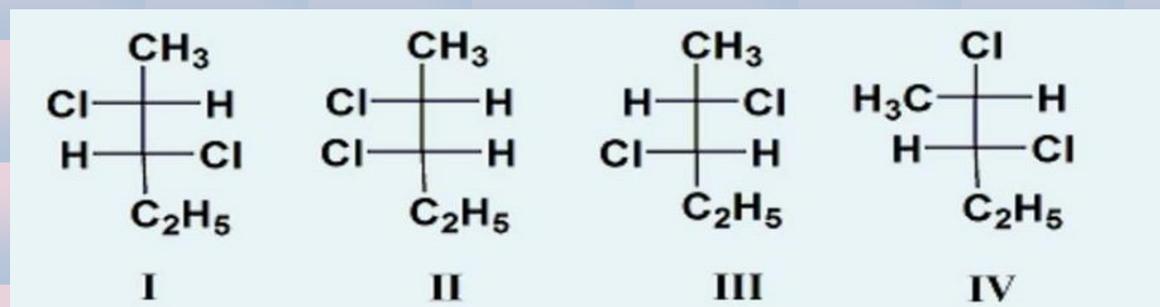
- a. II only
- b. I only
- c. I and III
- d. I and II
- e. III only

9) Which molecule is a meso form?



- a. II and III
- b. III only
- c. IV only
- d. II only
- e. none of them

10) Which structures are pair of enantiomers?



- a. II and IV
- b. I and III
- c. I and II
- d. I and IV
- e. II and III

11) (S)-2-chlorobutane gave an optically inactive substitution product. What is the reagent and mechanism of this reaction?

- a. NaOH; $S_N1 + S_N2$
- b. CH₃OH; S_N1
- c. Sodium tert-butoxide; E₂
- d. NaOCH₃; S_N2
- e. CH₃ONa; S_N2

12) What describes the nature of the major addition product of the following reaction?



- a. optically active mixture of two diastereomers
- b. optically inactive mixture of equal amounts of enantiomers
- c. optically active mixture of two enantiomers in unequal amounts
- d. optically inactive mixture of equal amounts of diastereomers
- e. optically inactive meso-form product

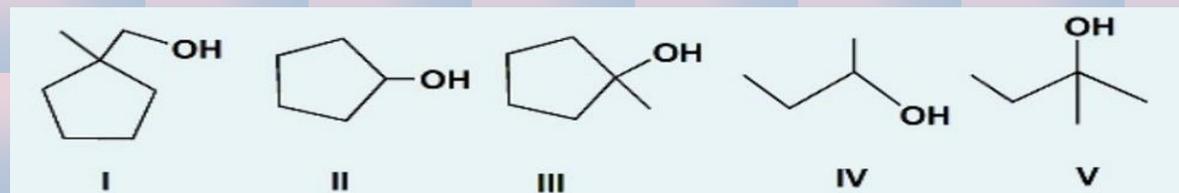
13) Which reagent would you use to prepare an alkene from alcohol?

- a. HBO
- b. PCI
- c. CrO₃
- d. Na OC(CH₃)₃
- e. H₂SO₄

14) How many possible stereoisomers does the following molecule have? CH₃-CH(OH)-CH₂-CH(OH)-CH₃

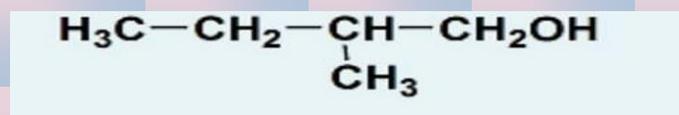
- a. 6
- b. 4
- c. 3
- d. 8
- e. 2

15) Which compounds give carboxylic acid upon reaction with CrO_3/H^+ ?



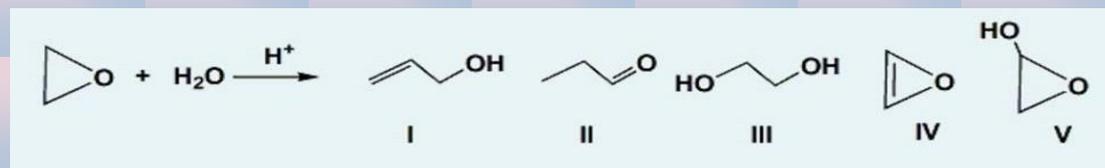
- a. I only
- b. I and II
- c. IV only
- d. II only
- e. II and III
- f. IV and v

16) Which starting material will give this alcohol as major product upon reaction with BH_3 followed by $\text{H}_2\text{O}_2/\text{HO}^-$?



- a. 2-methyl-1,3-butadiene
- b. 3-methyl-1-butyne
- c. 2-methyl-2-butene
- d. 3-methyl-1-butene
- e. 2-methyl-1-butene

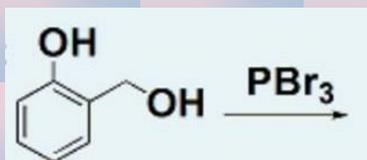
17) What is the product of the following reaction?



- a. IV
- b. II
- c. I

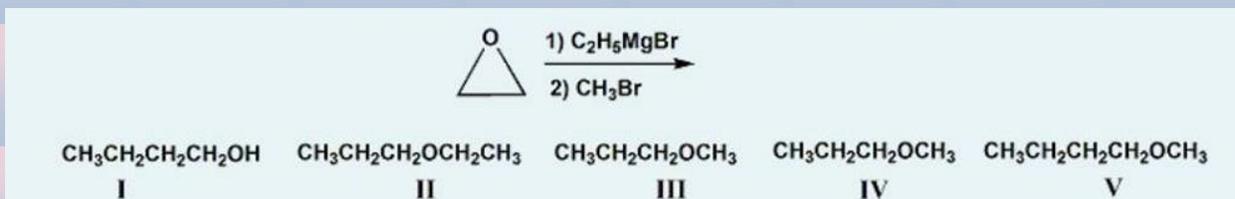
- d. V
- e. III

18) Which is the major product of the following reaction?



- a. II and IV
- b. II
- c. IV
- d. III
- e. I

19) Which is the major product of the following reaction?



- a. V
- b. III
- c. II
- d. IV
- e. I

20) Which is the weakest nucleophile?

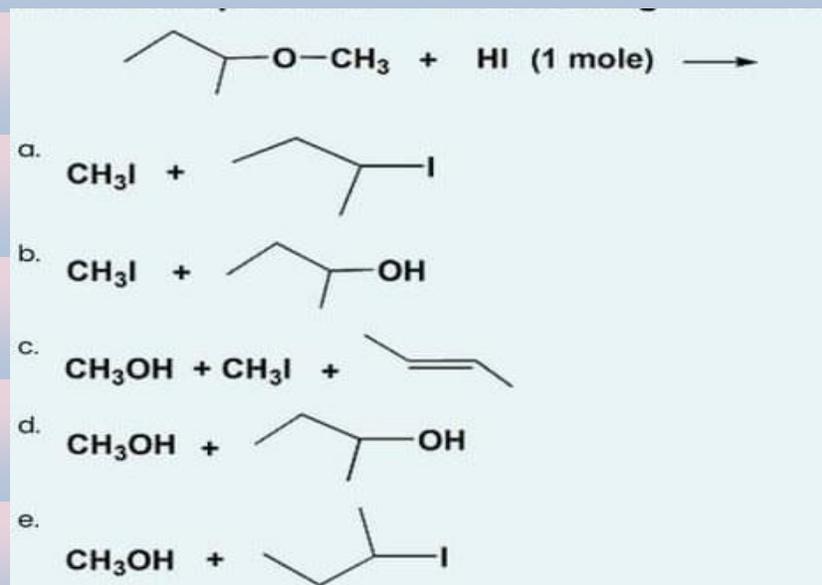
- a. $\text{HS-CH}_2\text{CH}_3$
- b. $\text{Na O-CH}_2\text{CH}_3$

- c. CN-
- d. Na S-CH₂CH₃
- e. HO-CH₂CH₃

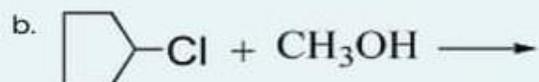
21) When 12.0 g of an unknown substance is dissolved in 100.0 ml water it gives an observed rotation of + 2.4° using a 10-cm sample tube. What is its specific rotation ?

- a. + 24
- b. + 20
- c. + 40
- d. + 36
- e. + 48

22) What are the products of the following reaction?



23) Which is the best Williamson synthesis of cyclopentyl methyl ether?



ANSWERS

1-c	2-a	3-e	4-b	5-c	6-a	7-a	8-c	9-d	10-b
11-b	12-a	13-e	14-c	15-a	16-e	17-e	18-e	19-a	20-e
21-b	22-b	23-a							

BELIEVE IN ALLAH

THEN

BELIEVE IN YOURSELF

YOU CAN DO IT,

ACHIEVE IT

AND REALIZE YOUR DREAM