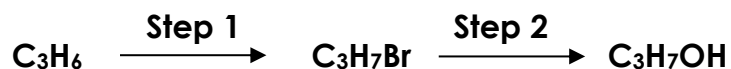


## Quiz (Inter-conversions of carbon compounds)

### Section A: Multiple-choice

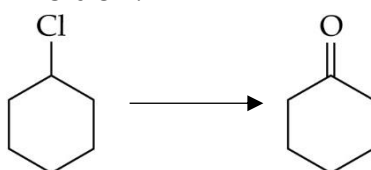
1. Consider the following reaction pathway:



Which of the following statements is INCORRECT?

- A. The reaction involved in step 1 is an addition reaction.
- B. The reagent used in step 1 is bromine (dissolved in an organic solvent).
- C. The reaction involved in step 2 is a substitution reaction.
- D. The reagent used in step 2 is sodium hydroxide solution.

2. Consider the following conversion:

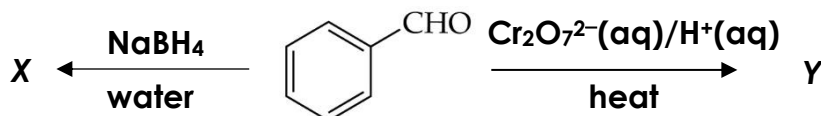


Which of the following reagents are needed for the above conversion?

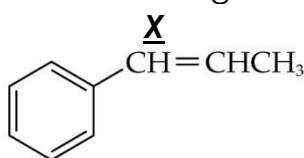
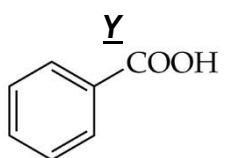
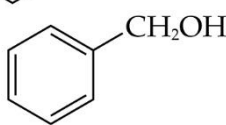
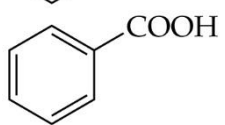
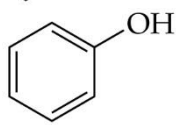
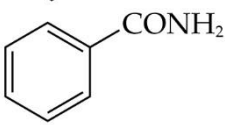
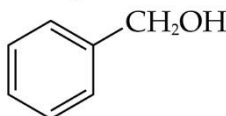
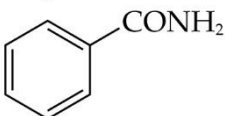
- (1) Acidified potassium dichromate solution
- (2) Concentrated sulphuric acid
- (3) Dilute sodium hydroxide solution

- A. (1) and (2) only
- B. (1) and (3) only
- C. (2) and (3) only
- D. (1), (2) and (3)

4. Consider the following reactions.



Which of the following combinations is correct?

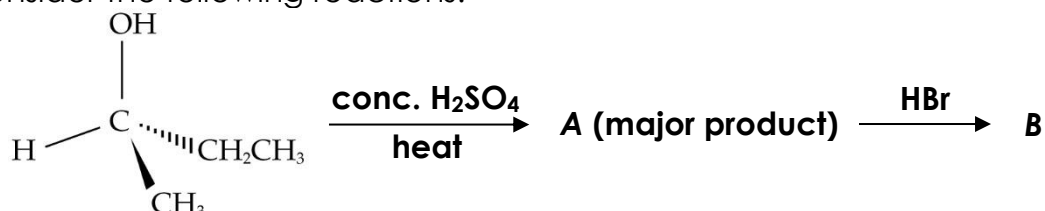
- A.  
- B.  
- C.  
- D.  

3. Which of the following statements about the conversion of butanoic acid to 1-bromobutane are correct?

- (1) A primary alcohol is one of the intermediate compounds.  
 (2) The conversion involves a substitution reaction.  
 (3) Sodium borohydride is one of the reagents.

- A. (1) and (2) only                      B. (1) and (3) only  
 C. (2) and (3) only                      D. (1), (2) and (3)

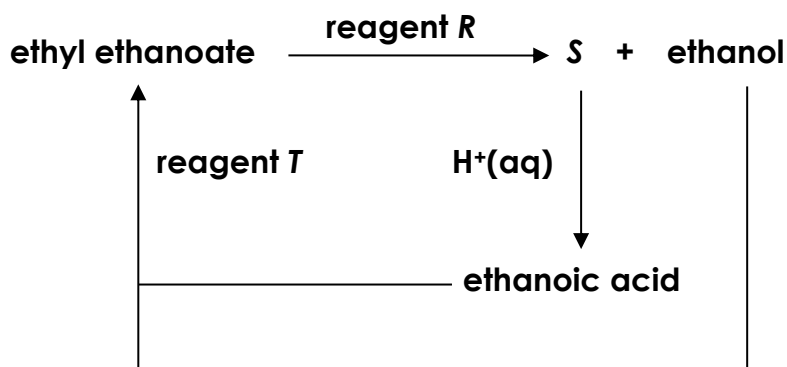
5. Consider the following reactions.



Which of the following combinations is correct?

- |    | <u>A</u>  | <u>B</u>      |
|----|-----------|---------------|
| A. | But-1-ene | 1-bromobutane |
| B. | But-1-ene | 2-bromobutane |
| C. | But-2-ene | 1-bromobutane |
| D. | But-2-ene | 2-bromobutane |

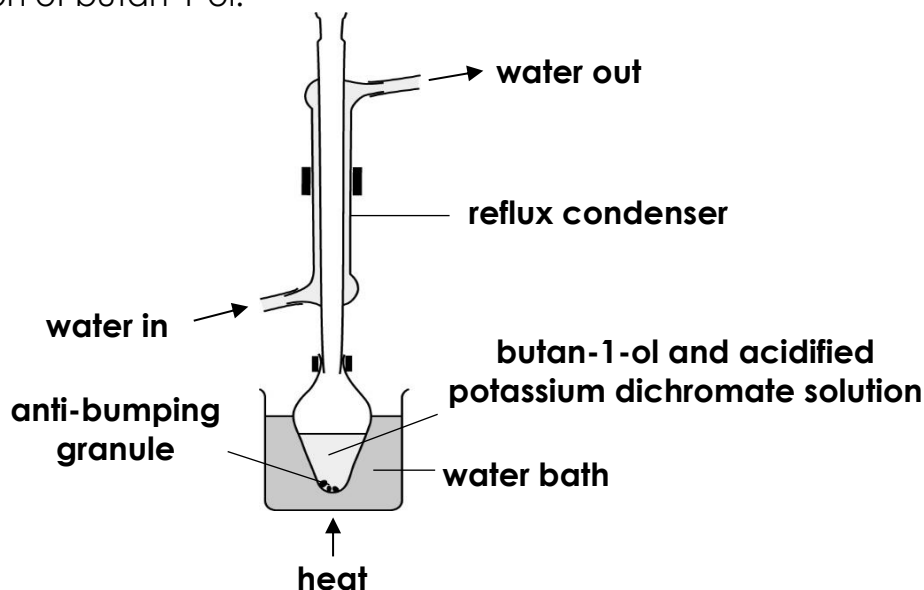
6. Consider the following series of reactions of ethyl ethanoate:



Which of the following combinations is correct?

- |    | <u>Reagent R</u>          | <u>Reagent T</u>                        |
|----|---------------------------|---|
| A. | sodium hydroxide solution | acidified potassium dichromate solution |
| B. | hydrochloric acid         | acidified potassium dichromate solution |
| C. | sodium hydroxide solution | concentrated sulphuric acid             |
| D. | hydrochloric acid         | concentrated sulphuric acid             |

**Questions 7 and 8** refer to an experiment. A student uses the following set-up to study the oxidation of butan-1-ol:

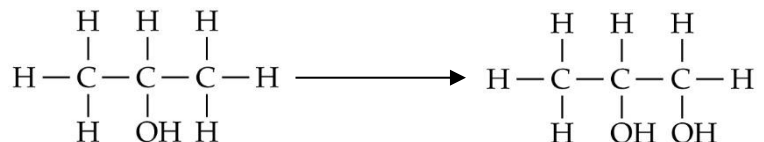


7. Which of the following statements about the experiment are correct?
- (1) The reaction mixture changes from orange to green.
  - (2) Physical change occurs on the inner wall of the reflux condenser.
  - (3) Butanal is one of the final products of the reaction.
- A. (1) and (2) only                      B. (1) and (3) only  
 C. (2) and (3) only                     D. (1), (2) and (3)
8. If 5.0 cm<sup>3</sup> of butan-1-ol is used in the experiment, what is the theoretical mass of the organic product obtained?  
 (Relative atomic masses: H = 1.0, C = 12.0, O = 16.0; density of butan-1-ol = 0.81 g cm<sup>-3</sup>.)
- A. 1.57 g                                      B. 1.87 g  
 C. 4.81 g                                      D. 5.95 g

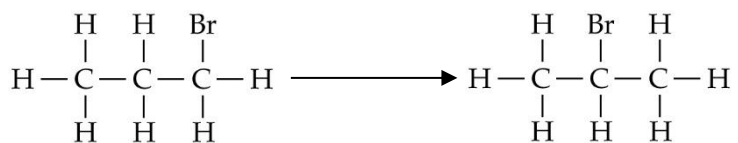
### Section B: Structured questions

Outline a synthetic route, with no more than three steps, to accomplish the following conversions. For each step, give the reagent(s), reaction conditions and structures of the intermediates.

(a)



(b)



(c)  $\text{CH}_3\text{CH}_2\text{CHO} \longrightarrow \text{CH}_3\text{CH}=\text{CH}_2$

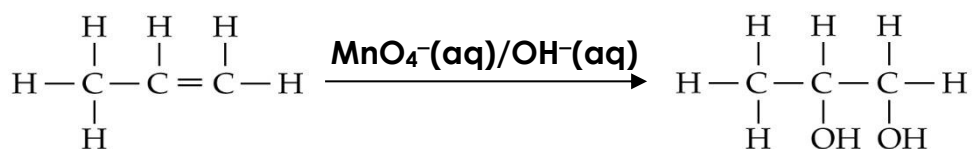
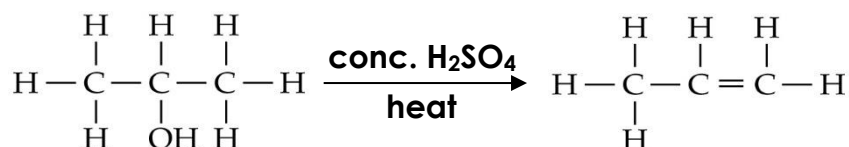
## Suggested Answer

## Section A

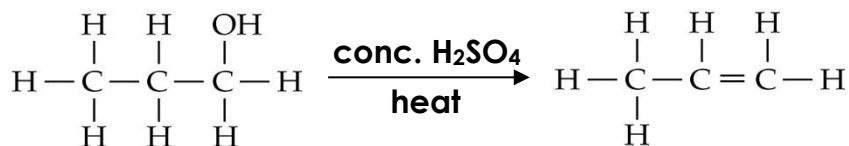
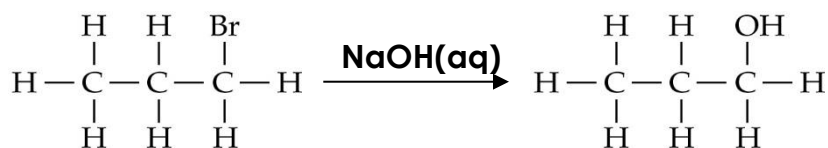
1.	B	5.	D
2.	B	6.	C
3.	B	7.	A
4.	A	8.	C

## Section B

(a)



(b)



(c)

