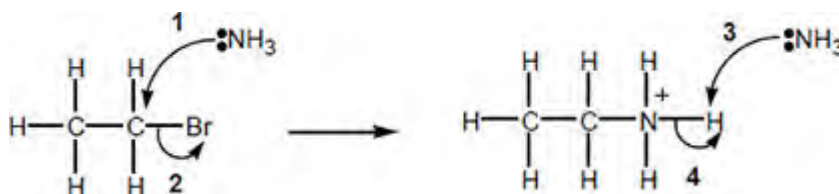


**Q1.** This question is about a method that can be used to prepare ethylamine.

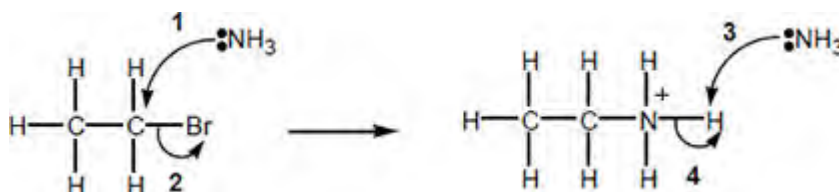


Which of the curly arrows in the mechanism is **not** correct?

- A 1
- B 2
- C 3
- D 4

(Total 1 mark)

**Q2.** This question is about a method that can be used to prepare ethylamine.



Which statement about the reaction is **not** correct?

- A Ethylamine is a primary amine.
- B The mechanism is a nucleophilic substitution.
- C Using an excess of bromoethane will prevent further reaction to form a mixture of amine products.
- D Ammonium bromide is an ionic compound.

(Total 1 mark)

**Q3.** Why are fluoroalkanes unreactive?

- A** Fluorine is highly electronegative.
- B** The F<sup>-</sup> ion is very stable.
- C** They are polar molecules.
- D** The C–F bond is very strong.

**(Total 1 mark)**

**Q4.** How many different alkenes are formed when 2-bromo-3-methylbutane reacts with ethanolic potassium hydroxide?

- A** 2
- B** 3
- C** 4
- D** 5

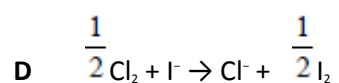
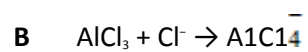
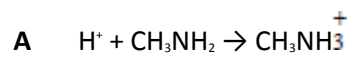
**(Total 1 mark)**

**Q5.** Which one of the following statements explains best why fluoroalkanes are the least reactive haloalkanes?

- A** Fluorine is much more electronegative than carbon.
- B** The F<sup>-</sup> ion is the most stable halide ion.
- C** The C–F bond is the most polar carbon–halogen bond.
- D** The C–F bond is the strongest carbon–halogen bond.

**(Total 1 mark)**

**Q6.** Which one of the following reactions does **not** involve donation of an electron pair?



**(Total 1 mark)**

**Q7.** How many different alkenes are formed when 2-bromo-2-methylbutane reacts with ethanolic potassium hydroxide?

**A** 2

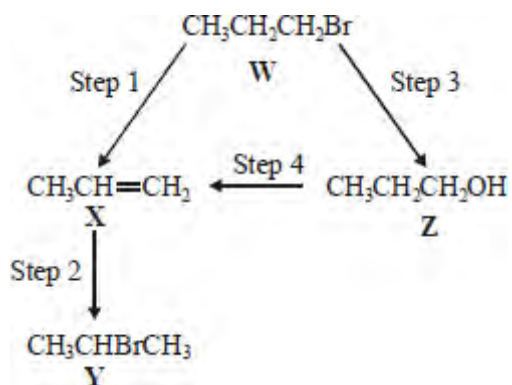
**B** 3

**C** 4

**D** 5

**(Total 1 mark)**

Q8. For this question refer to the reaction scheme below.

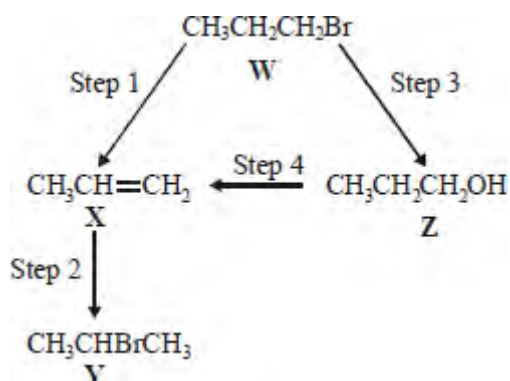


Which one of the following statements is **not** correct?

- A Reaction of **W** with sodium cyanide followed by hydrolysis of the resulting product gives propanoic acid.
- B Mild oxidation of **Z** produces a compound that reacts with Tollens' reagent, forming a silver mirror.
- C **Z** reacts with ethanoic acid to produce the ester propyl ethanoate.
- C **W** undergoes addition polymerisation to form poly(propene).

(Total 1 mark)

Q9. For this question refer to the reaction scheme below.

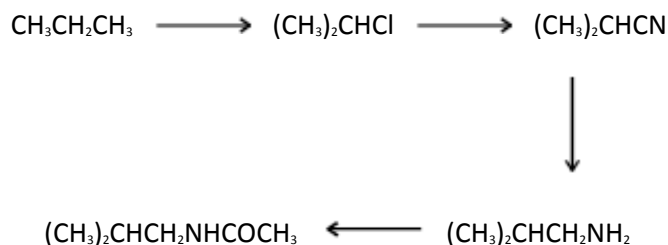


Which one of the following reagents would **not** bring about the reaction indicated?

- A Step 1 : alcoholic KOH
- B Step 2 : aqueous Br<sub>2</sub>
- C Step 3 : aqueous NaOH
- C Step 4 : concentrated H<sub>2</sub>SO<sub>4</sub>

(Total 1 mark)

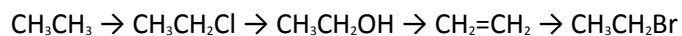
Q10. Which one of the following types of reaction mechanism is **not** involved in the above sequence?



- A free-radical substitution
- B nucleophilic substitution
- C elimination
- D nucleophilic addition-elimination

(Total 1 mark)

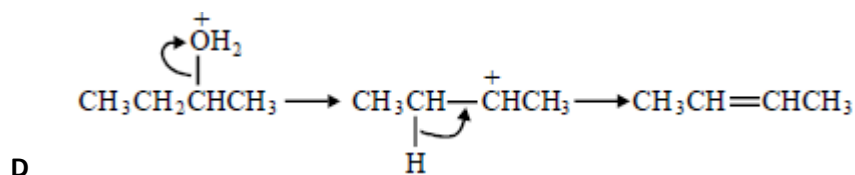
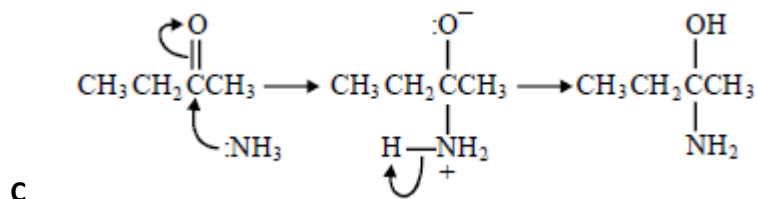
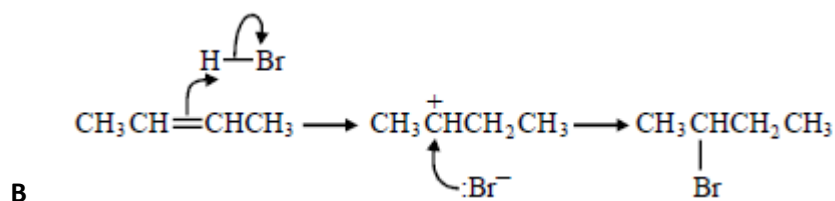
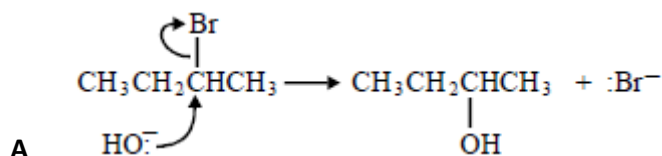
**Q11.** Which one of the following mechanisms is **not** involved in the reaction sequence below?



- A electrophilic addition
- B electrophilic substitution
- C nucleophilic substitution
- D free-radical substitution

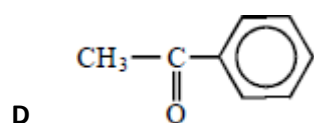
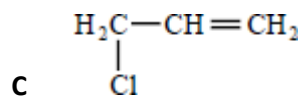
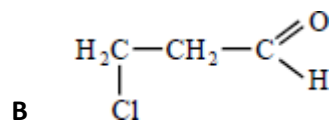
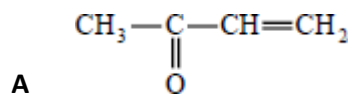
(Total 1 mark)

**Q12.** In which of the following is a curly arrow used incorrectly?



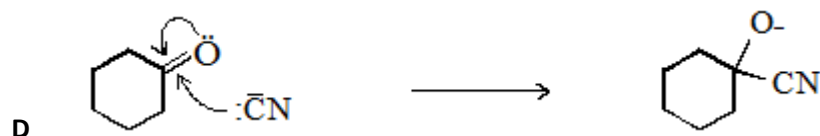
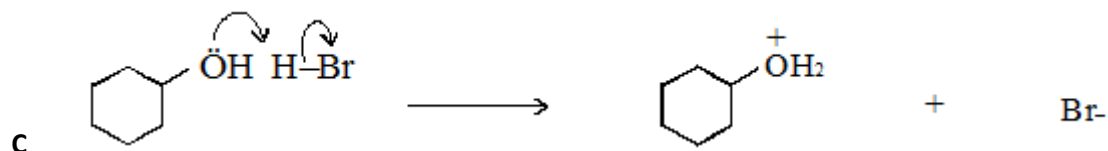
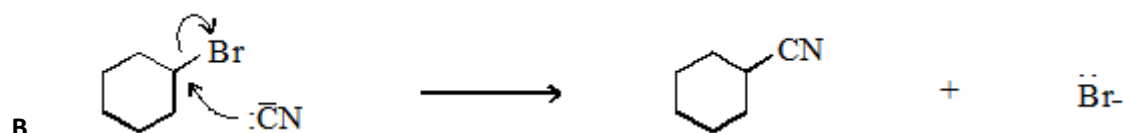
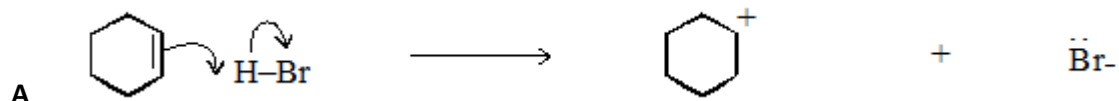
(Total 1 mark)

**Q13.** Which one of the following can react both by nucleophilic addition and by nucleophilic substitution?



(Total 1 mark)

**Q14.** In which one of the following are the curly arrows **not** used correctly?



(Total 1 mark)

**Q15.** Which one of the following is **not** a suitable method for the preparation of ethanol?

- A** oxidation of ethane
- B** hydration of ethene
- C** reduction of ethanal
- D** hydrolysis of bromoethane

**(Total 1 mark)**

**Q16.** Which one of the following reactions involves nucleophilic addition?

- A**  $\text{CH}_3\text{CH}=\text{CH}_2 + \text{HBr} \rightarrow \text{CH}_3\text{CHBrCH}_3$
- B**  $\text{CH}_3\text{CH}_2\text{CH}_3 + \text{Cl}_2 \rightarrow \text{CH}_3\text{CHClCH}_3 + \text{HCl}$
- C**  $\text{CH}_3\text{CH}_2\text{CH}_2\text{Br} + \text{NaOH} \rightarrow \text{CH}_3\text{CH}_2\text{CH}_2\text{OH} + \text{NaBr}$
- D**  $\text{CH}_3\text{CH}_2\text{CHO} + \text{HCN} \rightarrow \text{CH}_3\text{CH}_2\text{CH}(\text{OH})\text{CN}$

**(Total 1 mark)**