Review Question –Halogenoalkanes & Alcohols

C_4H_9Br has two isomers, isomer A and B.

a) Name and draw the structure of each isomer.

b) Isomer A reacts with cold dilute aqueous alkali and yields a product X. State the reaction mechanism and explain your choice. Name and draw the structure B

c) When X is added to acidified potassium dichromate, upon reflux a product Y is produced. When product Y is added to sodium bicarbonate, colourless gas and slow fizzing is observed.

i) State the name of Y and draw its structure.

ii) Name the type of reaction undergone by X to form Y.

d) Isomer B is also reacted with cold dilute aqueous alkali. However, a product Z is obtained. When Z is reacted with acidified dichromate it yields product W. W does not react with sodium bicarbonate.

i) Identify Z and draw its structure. Identify the type of isomerism and explain why this isomerism is observed in Z and draw the possible isomers of Z.
ii) Explain why the type of reaction mechanism observed by B to form Z is undergone by the isomer B
iii) Identify W and draw its structure. Name the type of reaction undergone by Z to obtain W.

e) Z is reacted with excess concentrated phosphoric acid at high temperatures. A product Q is obtained. Q decolourises bromine.

Identify the nature, structure and state the name of Q.

State the isomerism, if any, exhibited by Q.
Explain why this type of isomerism is exhibited by Q has isomers.

f) Q may also be converted back to B, state the reagents and the conditions for this conversion.