

## Question 20 (4 marks)

- (a) Identify ONE common household base.

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..... Caustic Soda ('Draino') .....

- (b) A student used indicators to determine whether three colourless solutions were acidic or basic. The indicators used are shown in the table.

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Indicator	Colour change	pH range
Methyl orange	red to yellow	3.2–4.4
Methyl red	red to yellow	4.8–6.0
Thymol blue	yellow to blue	8.0–9.6
Alizarin	red to purple	11.0–12.4

Samples of each solution were tested with the indicators. The colours of the resulting solutions are shown in the table.

Indicator added	Colour of solution A	Colour of solution B	Colour of solution C
Methyl orange	yellow	yellow	yellow
Methyl red	yellow	yellow	yellow
Thymol blue	blue	blue	yellow
Alizarin	purple	red	red

The student concluded that each of the three solutions tested was basic. Assess the validity of this conclusion.

..... The use of Methyl orange & Methyl Red ensured that the solutions were greater than pH 6. But there is a gap of ~~no~~ 'unknown' between pH 6 & pH 8 (Thymol blue), therefore solution C is somewhere between the pH 6–8 which means it could be slightly acidic or basic. Therefore the student's conclusion is not valid, further tests need to be done to determine the acidity or basicity of solution C. Solution A & B however show clearly the pH is over 12.4 & 9.6 respectively ∴ both basic.