## Equilibria - 2022 June A2 Chemistry 9701

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(c) The buffer system in seawater contains a mixture of HCO<sub>3</sub><sup>-</sup> and H<sub>2</sub>CO<sub>3</sub>.

equilibrium 5 
$$H_2CO_3 + H_2O \rightleftharpoons HCO_3^- + H_3O^+$$

(i) Define a buffer solution.

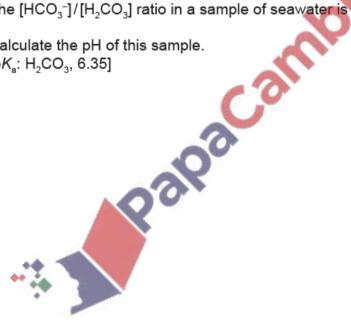
......[2]

(ii) Construct two equations to show how equilibrium 5 acts as a buffer solution.

......[2]

(iii) The [HCO<sub>3</sub>-]/[H<sub>2</sub>CO<sub>3</sub>] ratio in a sample of seawater is 14.1.

Calculate the pH of this sample.  $[pK_a: H_2CO_3, 6.35]$ 



pH = .....[3]