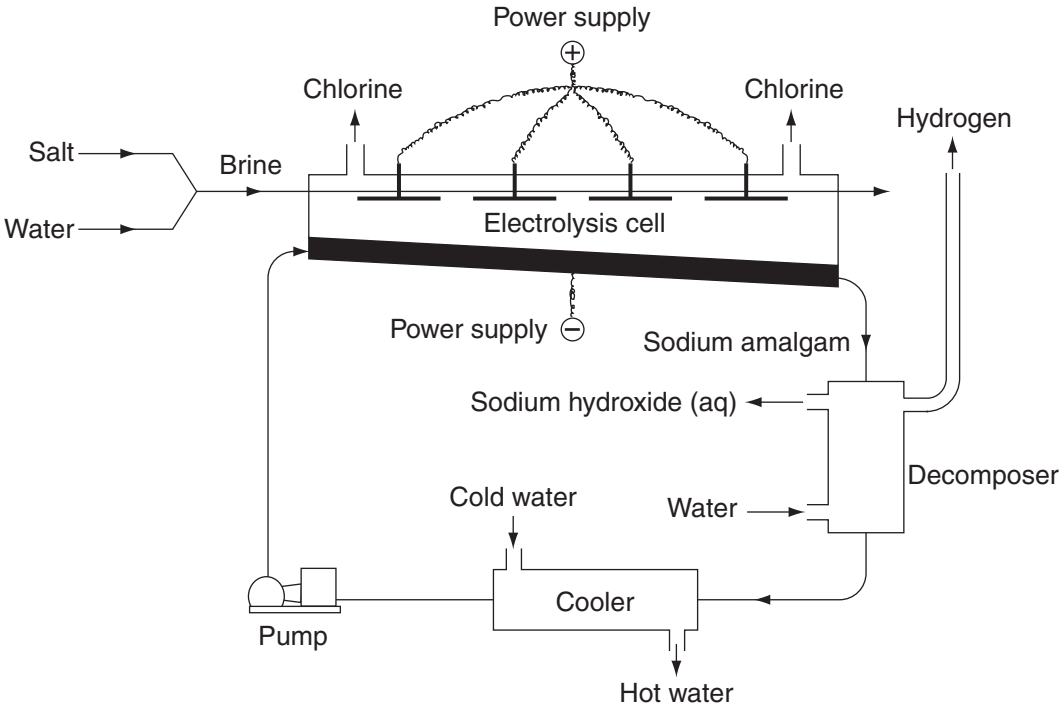
Question 32 — Industrial Chemistry (25 marks)

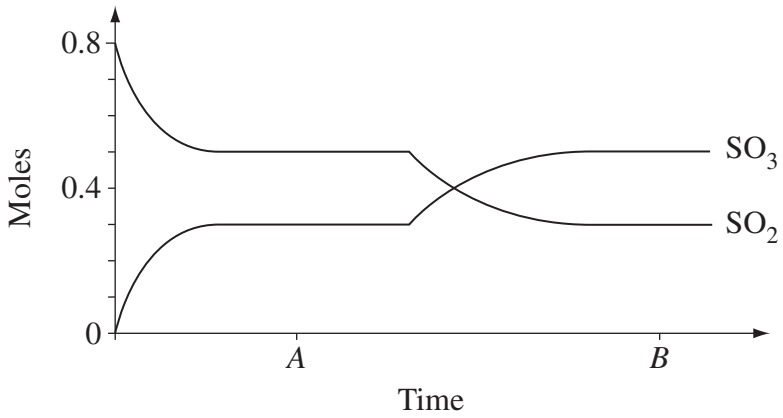
Answer parts (a)–(c) in a writing booklet.

(a) Identify the type of cell shown and outline the process used in the extraction of sodium hydroxide. **3**



(b) Compare the electrolysis of molten sodium chloride and aqueous sodium chloride. Write the relevant half equations and overall reaction for each process. **5**

(c) At room temperature 0.80 moles of SO_2 and 0.40 moles of O_2 were introduced into a sealed 10 L vessel and allowed to come to equilibrium.



(i) Write the equilibrium constant expression and calculate the value for the equilibrium constant at time *A*. **3**

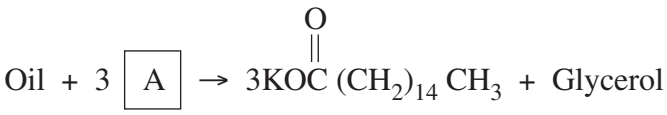
(ii) Explain why a new equilibrium position was established at time *B*. **2**

Question 32 continues on page 27

Question 32 (continued)

Answer parts (d)–(e) in a SEPARATE writing booklet.

(d) The equation represents a reaction that can be performed in a school laboratory.



(i) Identify both this type of reaction and the reactant *A*. **2**

(ii) Describe how this type of reaction could be carried out in a school laboratory including specific safety precautions for this process. **3**

(e) Assess both the importance and resulting environmental impacts of using limestone in the Solvay Process. **7**

End of Question 32