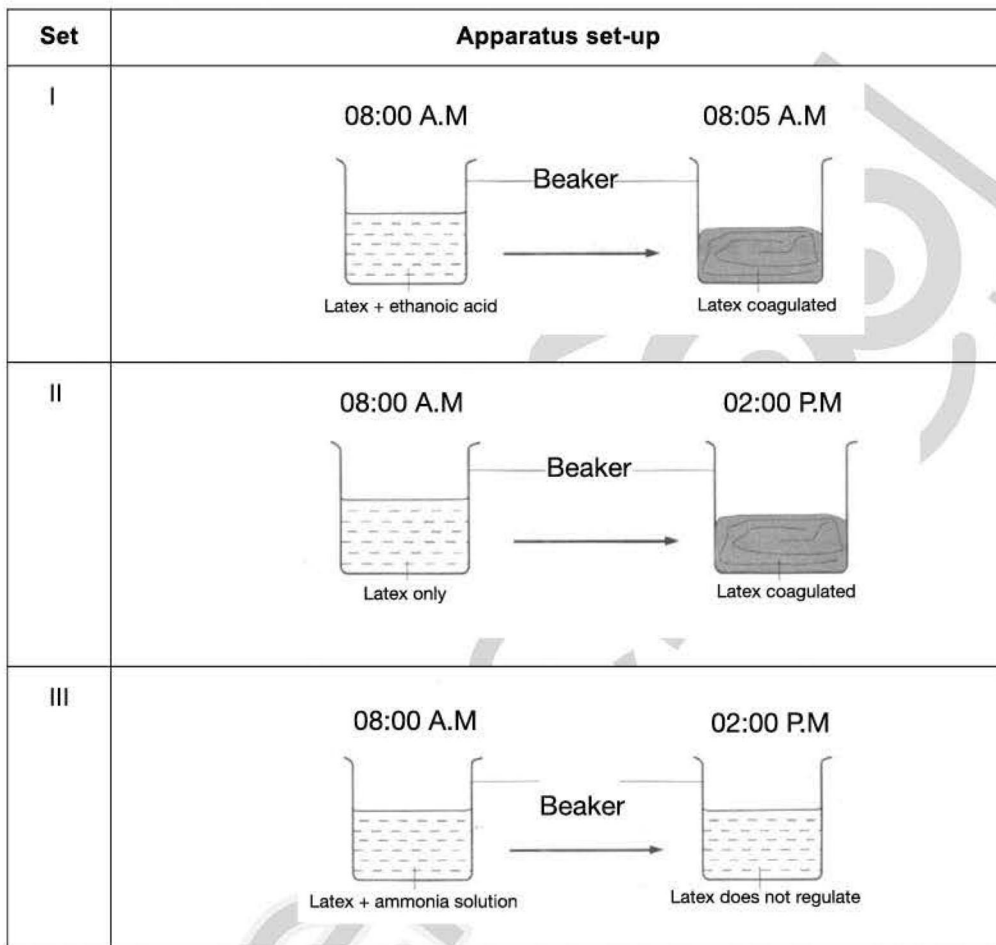# Chemistry   *Paper 3*   [4541/3] ▶

[50 marks]
Answer **All** Questions

1. Diagram 1 shows three sets, Set I, Set II and Set III of the apparatus set up for an experiment to investigate the effect of ethanoic acid and ammonia solution on the coagulation of latex.

Set	Apparatus set-up
I	
II	
III	

(a) State one hypothesis based on set I and set III.

_____
_____
_____
_____ [3 marks]

(b) Record the time taken for the latex to coagulate in set I and II.

Set I : _____
Set II : _____ [3 marks]

(c) Construct a table to record the time taken for coagulation of latex in Set I and set II.   [3 marks]

(d) State **one** observation that can be obtained from each set of this experiment.

Set	Observation
I	
II	
III	

[3 marks]

(e) State one inference from the experiments.

_____

_____

_____ [3 marks]

(f) State the operational definition for the coagulation of latex.

_____

_____

_____ [3 marks]

(g) Based on the experiment, state:

   (i)   The manipulated variable: _____

   (ii) The responding variable : _____

   (iii) The constant variable : _____   [3 marks]

(h) (i) Excess nitric acid is added to the beaker in set III after 2.00 p.m.
        What observation can be made about the latex?

   _____

   _____

   _____ [3 marks]

   (ii) Explain the answer in 1 (h)(i).

   _____

   _____

   _____ [3 marks]

(i) Explain why latex can coagulate without acid in set II.

_____

_____

_____ [3 marks]

(j) (i) Give reason why the latex in set II coagulates slower than the latex in set I.

   _____

   _____

   _____ [3 marks]

   (ii) The following is a list of chemical substances:
   - Hydrochloric acid
   - Sodium hydroxide
   - Propanoic acid
   - Potassium hydroxide

   Classify these substances into substances that can coagulate and substances that cannot coagulate latex.   [3 marks]

2. One day, Ahmad and his friends went to the supermarket. They saw several food in a can which are not easily corroded. They also saw a galvanized zinc roof which is made from iron coated by zinc layer as diagram 2.
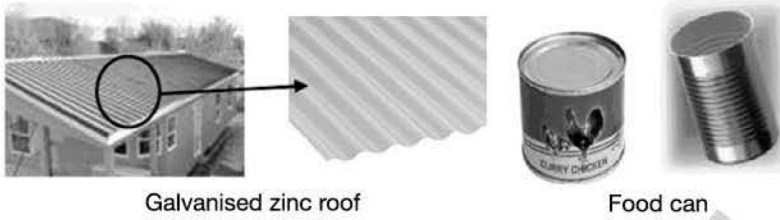

Galvanised zinc roof   Food can

Diagram 2

Refering to above example, plan a laboratory experiment to investigate the effect of other metals on the rusting of iron.
You are given iron nails, magnesium ribbon, zinc strip, copper strip and tin strip.
Your planning should include the following:

(a)   Statement of problem

(b)   All the variables

(c)   Statement of hypothesis

(d)   List of materials and apparatus

(e)   Procedure of the experiment

(f)   Tabulation of data   [17 marks]

END OF QUESTIONS PAPER