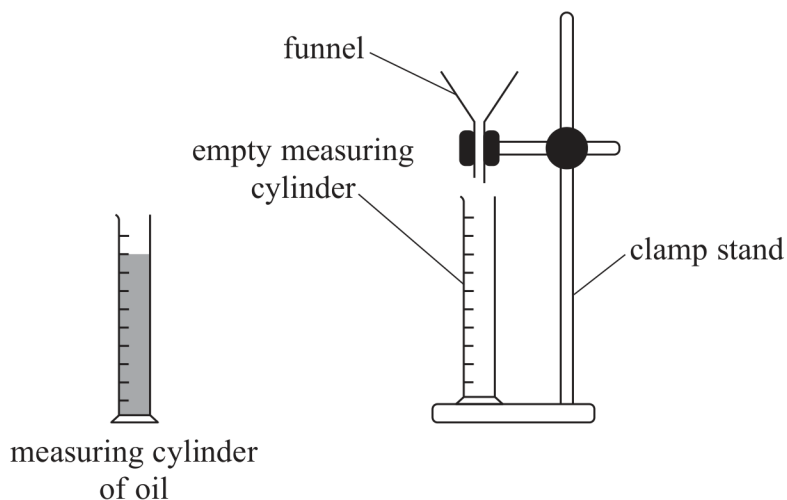


Answer ALL questions.

- 1 A student is investigating the effect of temperature on the viscosity of oil by measuring how fast the oil flows through a funnel. He uses the apparatus shown.



- (a) (i) State a piece of apparatus the student could use to vary the temperature of the oil.

(1)

- (ii) State a piece of apparatus the student could use to measure the time taken for the oil to flow through the funnel.

(1)

- (b) The two thermometers shown below are available.



liquid-in-glass thermometer



digital thermometer

He chooses to use the digital thermometer.

Justify his choice.

(2)



(c) (i) Identify one control variable in this investigation.

(1)

(ii) Describe how this variable can be controlled.

(1)

(d) The student initially measures the time from starting to pour the oil into the funnel to the last drop of oil falling from the funnel.

(i) State how the rate of flow of the oil should be calculated.

(1)

(ii) Describe how the same apparatus could be used to calculate a more accurate value for the rate of flow of the oil.

(2)

(Total for Question 1 = 9 marks)