Chem!stry

Name: …… **( )**

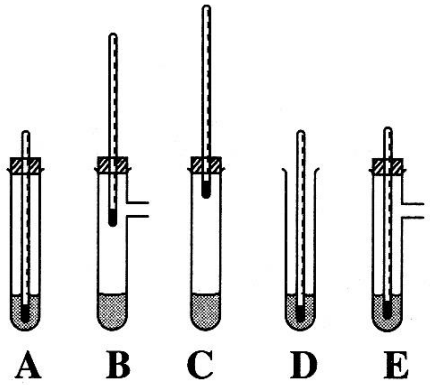
Class: ……

Date: …… **/** …… **/** ……

Experimental Techniques – Multiple Choice Quiz

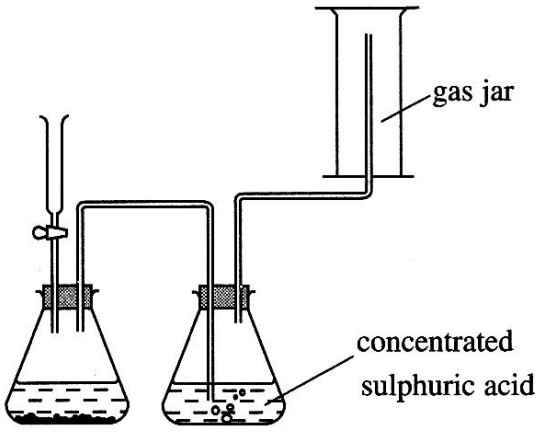
1.

The tubes below all contain a dilute solution of solid **X** dissolved in a liquid **Y**. Which apparatus is most suitable for finding the boiling point of liquid **Y**?



2.

The apparatus shown below was set up to prepare and collect a gas:



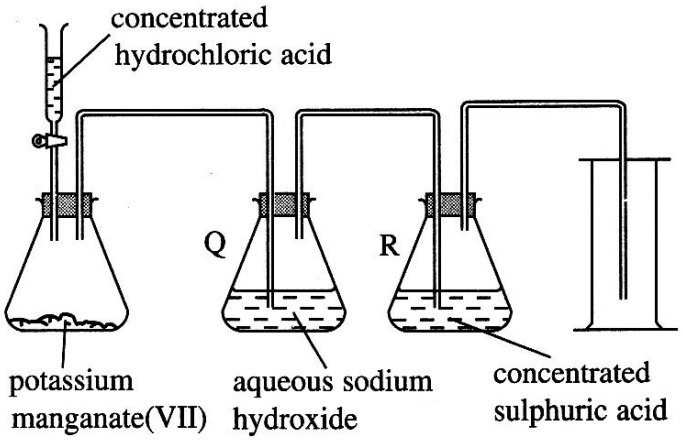
Which one of the following gases could be prepared and collected in the apparatus?

A Ammonia. **B** Carbon dioxide. **C** Hydrogen.

D Hydrogen chloride. **E** Sulphur dioxide.

3.

A student set up the apparatus below to prepare and collect dry chlorine:



What change should the student make to the apparatus?

A Use dilute sulfuric acid instead of concentrated sulfuric acid.

B Use sodium chloride instead of potassium manganate(VII).

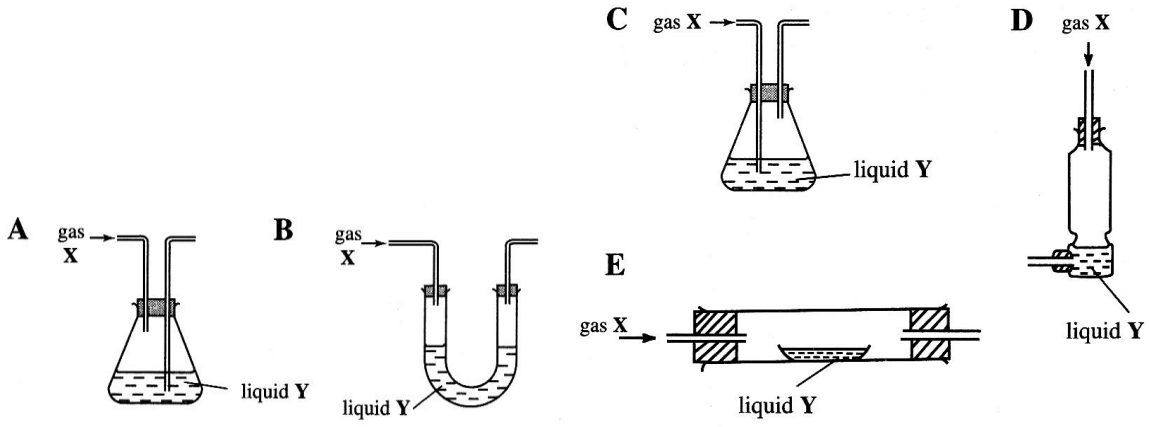
C Use water instead of aqueous sodium hydroxide.

D Reverse the order of flasks **Q** and **R**.

E Collect the gas over water.

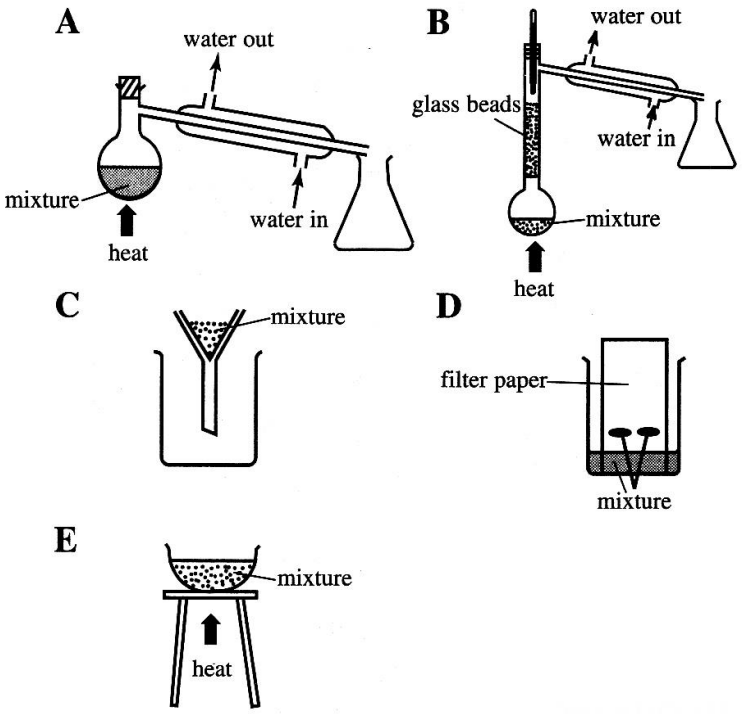
4.

Gas **X** may be purified by using liquid **Y**. Which of the following is the **most suitable** piece of apparatus to use?



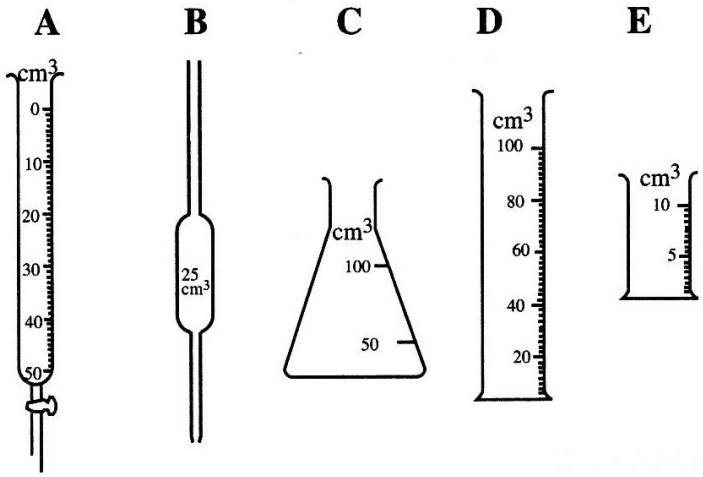
5.

Substance **X** melts at 53°C and boils at 100°C. It does not dissolve in water and it does not react with water. Which diagram shows the method **most suitable** for separating **X** from a mixture of **X** and water?



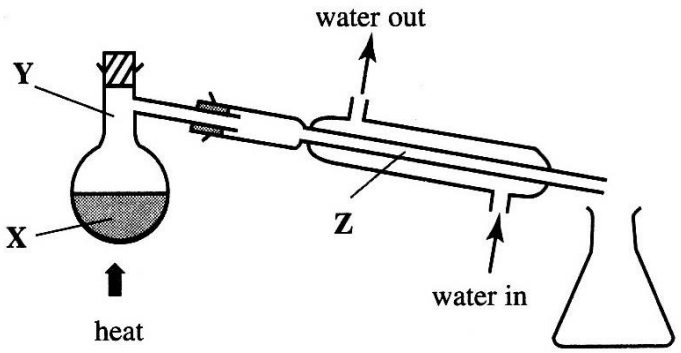
6.

Which of the following pieces of apparatus is **most suitable** for accurately measuring out 23.0 cm^3 of water?



7.

The diagram below shows the apparatus used to distil sea-water. At which point(s) is the temperature 100°C?

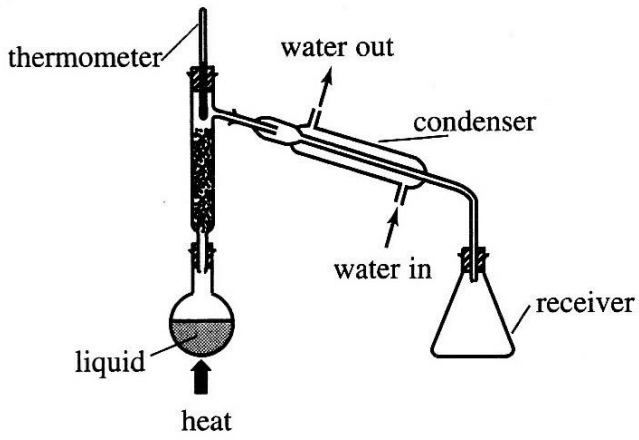


A **X** only. **B** **Y** only. **C** **X** and **Y** only.

D **Y** and **Z** only. **E** **X**, **Y** and **Z**.

8.

A student tries to separate ethanol and water by fractional distillation using the apparatus shown below:



Which error has the student made?

A The condenser is at the wrong angle.

B The thermometer is in the wrong position.

C The top of the receiver should be open.

D The water enters the condenser at the wrong place.

9.

A liquid is thought to be pure ethanoic acid. Which of the following is the **best** way to test its purity?

A Measure its boiling point.

B React it with ethanol.

C Burn it completely in oxygen.

D Dehydrate it with concentrated sulphuric acid.

E Use pH paper.

10.

Oxygen can be separated from nitrogen by the fractional distillation of liquid air. This is possible because:

A Air contains about 80% by volume of nitrogen.

B Nitrogen is an inert element.

C Oxygen has a higher density than nitrogen.

D Oxygen and nitrogen are in different Groups of the Periodic Table.

E Oxygen and nitrogen have different boiling points.

11.

To help diagnose illness, Doctors often need to know which amino acids are present in blood or urine. Which method is commonly used to separate and identify amino acids?

A	Chromatography.	**B**	Distillation.	**C**	Filtration.
D	Recrystallisation.	**E**	Sublimation.		

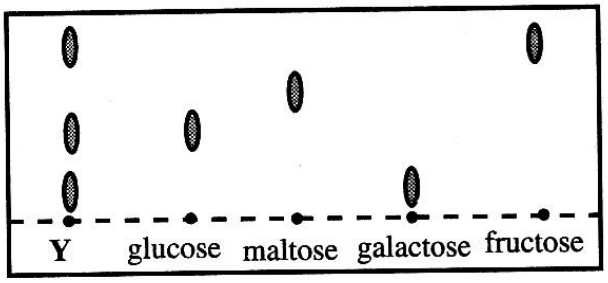
12.

Which of the following is the **best** method for obtaining water from ink?

A	Centrifuging.	**B**	Chromatography.	**C**	Distillation.
D	Filtration.	**E**	Freezing.		

13.

A sugar, raffinose, was treated with dilute hydrochloric acid. The resulting solution **Y**, together with some known sugar solutions for reference, was analysed by chromatography. The following chromatogram was obtained:

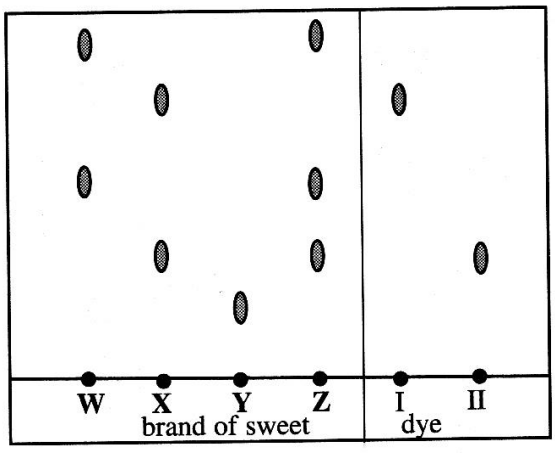


This evidence suggests that dilute hydrochloric acid breaks raffinose down into:

A Only two sugars, glucose and maltose.
B Glucose, galactose and fructose.
C Glucose, maltose and galactose.
D Glucose, maltose and fructose.
E Glucose, galactose and one sugar not among the reference sugars.

14.

The chromatogram below shows the dyes contained in four different sweets labelled **W**, **X**, **Y** and **Z**. Dyes I and II are harmful.

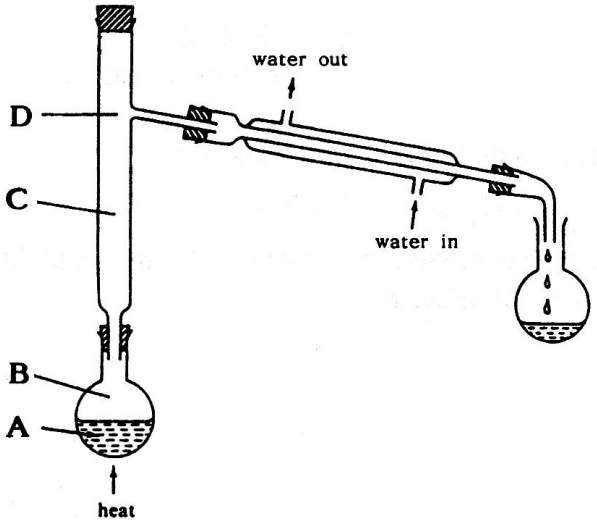


Which of the sweets contains a harmful dye?

A **W** and **X**.
B **W** and **Y**.
C **X** and **Y**.
D **X** and **Z**.
E **Y** and **Z**.

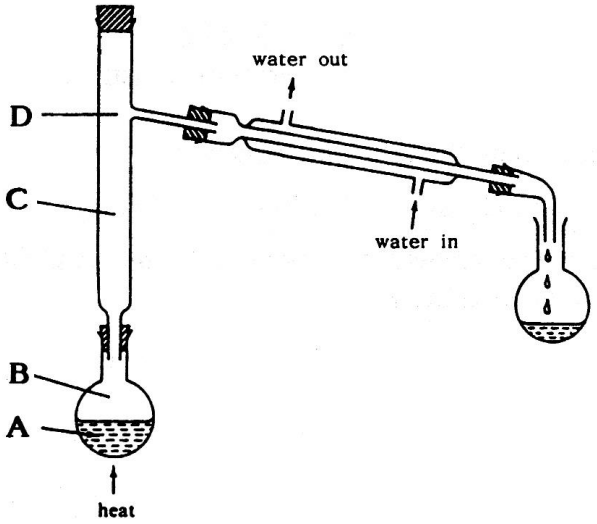
15.

If fractional distillation is to be used to separate a mixture of liquids, at which point **A**, **B**, **C** or **D** in the apparatus is it necessary to have the bulb of the thermometer?



16.

A mixture of two liquids is fractionally distilled in the apparatus below. Which of the following alterations would **best** improve the efficiency of the separation of the liquids?



A Inserting a thermometer at point **D**.

B Filling tube **C** with glass beads.

C Filling space **B** with ceramic wool.

D Putting “anti-bumping” granules into **A**.

17.

Which one of the following properties shows that a liquid is pure?

A It turns anhydrous copper(II) sulphate blue.

B It is colourless and odourless.

C It has no effect on red or blue litmus paper.

D It boils at a fixed temperature at a given pressure.

18.

For two substances to be separated by liquid chromatography, it is necessary that:

A They are both liquids.

B They are both soluble in the same solvent.

C They have different densities.

D They have different colours.

19.

What is the best way to remove insoluble solids from muddy water?

A Chlorination. **B** Distillation. **C** Evaporation.

D Filtration. **E** Oxidation.

20.

Which test could be used to show that a sample of water is pure?

A It freezes at exactly 0°C.

B It turns cobalt(II) chloride paper pink.

C It turns anhydrous copper(II) sulphate blue.

D When it reacts with sodium, hydrogen gas is formed.

E When it evaporates, it leaves no residue.

21.

The reaction between aqueous lead(II) nitrate and aqueous potassium iodide can be represented as:

$$Pb(NO_3)_2(aq) + 2KI(aq) \rightarrow PbI_2(s) + 2KNO_3(aq)$$

colourless colourless yellow colourless

Which method could be used to separate the products?

A Chromatography. **B** Evaporation. **C** Crystallisation.

D Filtration. **E** Distillation.

22.

The boiling points of some elements are given in the table below:

Element	**Boiling Point / °C**
Nitrogen	-196
Xenon	-108
Oxygen	-183

A mixture of oxygen, nitrogen and xenon at -200°C is allowed to warm up gradually by 20°C. Which of the substances will still be in the liquid state at the higher temperature?

A Nitrogen only. **B** Oxygen only. **C** Xenon only.

D A mixture of nitrogen and xenon.

E A mixture of nitrogen and oxygen.

23.

Which of the following substances may be condensed using a water-cooled condenser?

Substance	**Melting Point / °C**	**Boiling Point / °C**
A Butane	–135	–0.5
B Pentane	–130	+36
C Hydrogen chloride	–115	–85
D Ammonia	–78	–33
E Sulphur dioxide	–73	–10

- Scan the QR code below for the answers to this assignment.

http://www.chemist.sg/purification/purification_mcq_ans.pdf