Section A: Multiple Choice Questions (10 marks)
For each question, choose the most suitable option and indicate in the bracket provided.

1. Magnetic attraction can be used to separate objects made of ________________.
   (I) Iron
   (II) Copper
   (III) Aluminium
   (IV) Steel

   A  I, II, III and IV  C  I and II
   B  I, II and III  D  I and IV

2. In filtration, the term ‘filtrate’ refers to ________________.
   A  the solid that remains on the filter paper.
   B  the liquid that drains through the filter paper.
   C  the type of filter paper used.
   D  the mixture before separation.

3. Distillation can be used to separate ________________.
   A  a soluble solid from a solution.
   B  a liquid from a solution.
   C  a solid from a solid.
   D  an insoluble solid from a solution.
4. Fractional distillation cannot be used to ________________________________.
   A separate the components of liquid air.
   B refine crude oil.
   C test the purity of a substance
   D separate methanol and water

5. In fractional distillation, a mixture of liquids is separated based on their __________.
   A boiling points
   B solubility
   C density
   D chemical composition.

6. Chromatography can be used to ________________________________.
   (I) Test the purity if a substance
   (II) Separate a mixture
   (III) Identify the components of a dye
   (IV) Obtain pure water from sea water
   A I, II, III and IV
   B I, II and III
   C II and III only
   D III only

7. Which one of the following statements about reverse osmosis is not true?
   A It is an expensive process.
   B A membrane is used to separate water from the salt in the seawater.
   C It is a process used in Singapore to obtain drinking water.
   D Sea water is first heated before it is separated into water and salt.
8. Which one of the following can be separated by adding water, stirring and filtering?
   A  Copper and tin
   B  Salt and sugar
   C  Sulfur and sugar
   D  Salt and copper sulfate

9. Which of the following substances passes through the partially permeable membrane in reverse osmosis?
   A  Salt
   B  water
   C  Waste particles
   D  Salt and waste particles

10. From the chromatogram below, we can conclude that Z contains _____________.

   A  Only galactose and glucose
   B  Fructose, glucose and maltose
   C  Fructose, galactose and glucose
   D  Galactose, glucose and one other sugar
Section B : Structured Questions (21 marks)
Answer all questions in the space provided.

1. Name the method which is most suitable for separating the following substances. [7]

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<table>
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<tbody>
<tr>
<td>(a)</td>
<td>Tea leaves from a pot of tea</td>
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<tr>
<td>(b)</td>
<td>Red pigment from flower petals</td>
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<tr>
<td>(c)</td>
<td>Salt from seawater</td>
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<tr>
<td>(d)</td>
<td>Iron from crushed copper ores</td>
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<tr>
<td>(e)</td>
<td>Petrol from crude oil</td>
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<td>(f)</td>
<td>Water from seawater</td>
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<td>(g)</td>
<td>Drugs from a urine sample</td>
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2. Label the diagram by filling in the blanks [4]

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<table>
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<td>A - _____________________</td>
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   (b) What is liquid A? [1]

   _________________________________

   (c) State the function of E. [1]

   _________________________________

   (d) Name the type of flame used for heating. [1]

   _________________________________
(e) Name the method of separation that uses this set of apparatus. [1]

(f) Name the processes that occur in B and D. [2]

3 A chromatogram is obtained using three different dyes: green, blue and red and four solutions W, X, Y and Z.

(a) Which solution, A, X, Y or Z, contains the following dyes? [1½]
   (i) Only one dye ___________________
   (ii) All three dyes ___________________
   (iii) A yellow dye ___________________

(b) Can a mixture of gases be separated into different components using chromatography? [½]
(c) **Give two reasons why chromatography is useful in scientific research.** [2]

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Section C : Free response Questions (4 marks)
Answer all questions in the space provided.

1 (a) **Describe how you would obtain salt from a mixture of salt and sand.** [3]

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________________________________________________________________________

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(b) **Can sugar be obtained using the same method? Explain your answer.** [1]

________________________________________________________________________