YEAR 11 ATAR CHEMISTRY

**Task 9 Extended Response**

**CHROMATOGRAPHY**

NAME: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**MARKS ALLOCATION FOR ASSESSMENT:**

* Submission of research notes & information: can be submitted hand-written or via Connect as a Word document. (20% contribution)
* Validation test: to be conducted in the first week of Term 2 (80% contribution)

**QUESTIONS TO BE ANSWERED:**

1. Define the following terms relating to chromatographic techniques:
   1. Mobile phase
   2. Stationary phase
   3. Eluent
   4. Eluate
   5. Retention time
2. Explain the application of chromatographic techniques as qualitative and quantitative analyses.
3. Write a detailed description of the process of **thin layer chromatography**, including:
   1. What the stationary and mobile phase is made of (common materials).
   2. A labelled diagram showing the equipment used in the technique.
   3. How the components of the mixture are separated (What physical or chemical property is used to achieve the separation? What is the actual method of separation?).
   4. How the components of the mixture are identified.
4. Write a detailed description of the process of **gas chromatography (GC)**, including:
   1. what the stationary phase (column material) and mobile phase (carrier gas) is made up of (there may be a range of different substances, list up to three, the most common substance is fine).
   2. a labelled diagram showing the components of the instrument used in the technique.
   3. how the components of the mixture are separated (What physical or chemical property is used to achieve the separation? What is the actual method of separation?).
   4. how the components of the mixture are identified (what is the detector?).
   5. two applications of this technique (what is it used for?).
5. Write a detailed description of the process of **high-performance liquid chromatography (HPLC)**, including:
   1. what the stationary phase (column material) and mobile phase (solvent) is made of (there may be a range of substances, list up to three, the most common substance is fine).
   2. a labelled diagram showing the components of the instrument used in the technique.
   3. how the components of the mixture are separated (What physical or chemical property is used to achieve the separation? What is the actual process of separation?).
   4. how the components of the mixture are identified (what is the detector?).
   5. two applications of this technique (what is it used for?).
6. What is the difference between normal phase and reverse phase chromatography?

* A separate sheet is to be supplied to help to collate your research notes on thin layer chromatography, gas chromatography and high-performance liquid chromatography.
* A validation test will be conducted in class which will assess your knowledge of these analytical techniques. You will be permitted to take your research notes into the assessment.