Oil Refining: Questions

1. Decane is an alkane with a formula $C_{10}H_{22}$.

   (a) Cracking decane, under certain conditions, produces three products. These are

   ![Ethene](image1.png)  ![Propane](image2.png)  ![Propene](image3.png)

   Ethene  Propane  Propene

   (i) Which of these products is saturated and which is unsaturated?

   Saturated __________________________________________________________

   Unsaturated __________________________________________________________ [2]

   (ii) Describe a test which can be used to test whether a hydrocarbon is saturated or unsaturated.

   Test ____________________________________________________________ [1]

   Result for both hydrocarbons _______________________________________

   ____________________________________________________________ [1]

   (iii) Suggest a use of unsaturated hydrocarbons.

   ____________________________________________________________ [1]

   (iv) Cracking decane, under different conditions, produces two molecules. One of these molecules is ethene. What is the formula of the other product? Suggest a use for this product.

   Formula _________________________________________________________

   Use ____________________________________________________________ [2]
(b) Another process in oil refining, called platforming, involves re-forming straight chain alkanes into branched chain alkanes. Passing octane vapour (C₈H₁₈) over a platinum catalyst at high pressure and high temperature, produces a branched chain alkane. Draw the structure of a branched chain alkane with the formula C₈H₁₈.