Topic 7 – Introduction to Organic Chemistry (paper 2 only)

* I can deduce the empirical formula, molecular formula and general formula of any given organic compound
* I can draw the structural formula, displayed formula and skeletal formula of any given organic compound
* I can apply IUPAC rules for nomenclature to name an organic compound given the structure, and to draw the structure of an organic compound given the name, limited to chains and rings with up to six carbon atoms each
* I can describe the characteristics of a homologous series (a series of compounds containing the same functional group)
* I can define the term structural isomer and draw the structures of chain, position and functional group isomers
* I can define the term stereoisomer, draw the structural formulas of *E* and *Z* isomers and apply the CIP priority rules to *E* and *Z* isomers
* I can define alkanes as saturated hydrocarbons
* I can describe petroleum as a mixture consisting mainly of alkane hydrocarbons that can be separated by fractional distillation
* I can describe cracking as the breaking of C–C bonds in alkanes
* I can distinguish between thermal cracking (takes place at high pressure and high temperature and produces a high percentage of alkenes) and catalytic cracking (takes place at a slight pressure, high temperature and in the presence of a zeolite catalyst and is used mainly to produce motor fuels and aromatic hydrocarbons)
* I can explain the economic reasons for cracking alkanes
* I can describe alkanes as fuels, and that combustion of alkanes and other organic compounds can be complete or incomplete
* I can explain how the internal combustion engine produces a number of pollutants including NOx, CO, carbon and unburned hydrocarbons, and how these gaseous pollutants from internal combustion engines can be removed using catalytic converters
* I can explain how combustion of hydrocarbons containing sulfur leads to sulfur dioxide that causes air pollution
* I can explain why sulfur dioxide can be removed from flue gases using calcium oxide or calcium carbonate