Chemistry

Unit 1 – Paper 1

1. **Atomic structure**
   (atoms, chemical equations, separating mixtures, fractional distillation and paper chromatography, history of atom, atoms, ions, isotopes, electronic structures)
2. **The periodic table**
   (development of periodic table, electronic structure and periodic table, group 1, group 7, *transition elements*)
3. **Structure and bonding**
   (states of matter, ionic bonding, giant ionic structures, covalent bonding, structure of simple molecules, giant covalent structures, fullerenes and graphene, bonding in metals, giant metallic structures, *nanoparticles*)
4. **Chemical calculations**
   (relative masses and moles, **equations and calculations**, **from masses to balanced equations**, *yield of a chemical reactions, atom economy*, expressing concentrations, *titrations and calculations, volumes of gases*)
5. **Chemical changes**
   (reactivity series, displacement reactions, extracting metals, salts from metals, neutralisation and the pH scale, **strong and weak acids**)
6. **Electrolysis**
   (electrolysis, changes at the electrodes, extraction of aluminium, electrolysis of aqueous solutions)
7. **Energy changes**
   (exothermic and endothermic reactions, reaction profiles, **bond energy calculations**, *chemical cells and batteries, fuel cells*)

Unit 2 – Paper 2

8. **Rates and equilibrium**
   (Rates of reaction, collision theory and surface area, temperature, concentration and pressure, catalysts, reversible reactions, energy and reversible reactions, dynamic equilibrium, **altering conditions**)
9. **Crude oil and fuels**
   (hydrocabons, fractional distillation, combustion, cracking)
10. **Organic reactions**
    (*reactions of alkenes, structure of alcohols, carboxylic acids and esters, reactions and uses of alcohols*)
11. **Polymers**
    (*addition polymerisation, condensation polymerisation, natural polymers, DNA*)
12. **Chemical analysis**
    (pure substances and mixtures, analysing chromatograms, testing for gases, *tests for positive ions, tests for negative ions, instrumental analysis*)
13. **The Earth's atmosphere**
    (history of atmosphere, evolving atmosphere, greenhouse gases, global climate change, atmospheric pollutants)
14. **The Earth's resources**
    (finite and renewable resources, drinking water, treating waste water, **extracting metals from ores**, life cycle assessments, reduce, reuse, recycle)
15. **Using our resources**
    (*rusting, useful alloys, properties of polymers, glass, ceramics and composites, making ammonia- Haber process, economics of Haber process, making fertilisers in the lab and industry*)