MASTER CLASS

CHEMISTRY

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THE PAPER

3 HOURS

ANY 8 QUESTIONS OUT OF 11 TO COMPLETE. This year you can answer ANY 8 QUESTIONS.

50 MARKS EACH

22.5 MINUTES EACH

SECTION A - 3 QUESTIONS

QUESTION 1
VOLUMETRIC ANALYSIS – 8 mandatory experiments
This topic is always examined in this section. The good news is that there is quite a large amount of common material in each of the experiments.

Every year they examine **general practical procedures** which are roughly the same for each experiment that you do. For example how to prepare a solution in a volumetric flask and how to use a pipette, burette and conical flask.

Every year there are **calculations** to do. Since 2015 they have changed the way that the questions are worded to avoid the use of the formula so make yourself aware of this change. Also be familiar of the types of calculations that are asked in each experiment. For example, if it is a bleach or vinegar experiment they will ask for the concentration as %(w/v), in an iron tablet experiment it'll be percentage of iron (II) in the tablet(s).

Finally, you should take time to ensure you know the different **unique or specific questions** that go with each experiment. For example, why is sulfuric acid used at two different stages in the iron tablet experiment or why was the bleach/vinegar diluted before use in these experiments.

QUESTION 2
0RGANIC CHEMISTRY EXPERIMENT(S) – 7 mandatory experiments

These are divided into 4 **preparations** (ethene, ethyne, soap and benzoic acid) and 3 **techniques** (steam distillation with solvent extraction, chromatography and recrystallisation with finding the melting point).

Each experiment is different but I would go through this check list.

1. Any **diagram** showing the apparatus needed.
2. Any balanced **equations** needed.
3. **Safety procedures** unique to the experiment including hazard symbols.
4. If a technique, what **principle** is involved.
5. Any **calculations** needed e.g. determining limiting reactant and percentage yield.
6. Any **tests** being carried out on the preparations, e.g. combustion, tests for unsaturation.
7. **Observations** - Physical appearances of the materials used, effervescence, flame colours, colour changes.

QUESTION 3 - USUALLY ON ONE (OR MORE) OF THE REMAINING 12 MANDATORY EXPERIMENTS (BUT HAS BEEN A SECOND ORGANIC EXPERIMENT ON TWO OCCASIONS).

The common experiments to appear here are:
Rates of reaction experiments (usually involving drawing graphs and interpreting graphs).
Water- Colorimetry and Suspended and dissolved solids.
Heat of reaction of an acid with a base.
Gas laws – determining the Mr of a volatile liquid.

Tests for anions and flame tests appeared in this question.

<u>SECTION B</u>
There are 8 questions in section B. Three of which have an internal choice, 4, 10 and 11.

QUESTION 4
Three words. PRACTISE, PRACTISE, PRACTISE.

QUESTION 5
ATOMIC THEORY generally one of three topics
*Electronegativity and bonding including shapes of molecules
*Atomic radius and Ionization energies
*Scientists involved in the history of the periodic table and history of the atom/Radioactivity.

QUESTION 6
FUELS AND HEATS OF REACTION
Crude oil, natural gas, petrol.
Hess's law using heats of combustion and heats of formation.

QUESTION 8 OR 9
GENERAL ORGANIC CHEMISTRY
Drawing and naming organic molecules from 8 homologous series.
Reactions types and reagents and conditions involved in the conversion of one homologous series to another.
Mechanisms of free radical substitution and ionic addition reactions, with evidence.

QUESTION 10
THREE PARTS, PICK TWO

QUESTION 11
FOUR PARTS, PICK TWO

In questions 10 and 11 there is usually **more organic chemistry and more atomic theory**. This is also where there may be a stoichiometry problem to solve. Any other topic can appear in these questions. Part (d) of question 11 will be examining the option.

OTHER IMPORTANT TOPICS – there is usually a full question and a half question (minimum) on these areas of the syllabus.

CHEMICAL EQUILIBRIUM
RATES OF REACTION
WATER

ALLOCATION OF MARKS IN THE MAIN AREAS

Organic chemistry - 150 to 200 marks
Atomic theory - 81 marks
Volumetric analysis – 50 marks