Chemistry 3
INSTRUCTIONS
ALL GROUPS
0715 CONFIDENTIAL: For the Local Assistant Examiner or Supervisor only.

GENERAL CERTIFICATE OF EDUCATION(GCE) BOARD

General Certificate of Education Examination

JUNE 2021 **ADVANCED LEVEL**

Chemistry 3

PRACTICAL EXAMINATION

ALL GROUPS

Instructions to Local Assistant Examiner or Supervisor with regard to:

(1) Preparation for the Examination.
(2) Questionnaire for a report on candidate's work at the Examination and on the laboratory conditions.
(3) Duplication scheme.

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(1) **PREPARATION FOR THE EXAMINATION**
Candidates will record all their answers in the question booklet; **no separate answer booklet is required.**

Arrangement of Candidates and examination materials in the laboratory.

Candidates **MUST** be placed in the laboratory in the order of their Board examination numbers, and materials **MUST** be given strictly in their serial order, i.e. suppose six candidates have the numbers 2,5,12,15,16 and 20, then starting from the bench occupied by candidate 2, next to him is candidate 5, then 12 and so on. If the materials required are A, B, C and D, they **MUST** be issued so that candidate 2 (Ordinal Number 1) will have A_1, B_1,C_1 and D_1; candidate 5 (Ordinal Number 2) will have A_2, B_2, C_2, and D_2 and so on, candidate 20 having A_6, B_6, C_6 and D_6.
As a further check for both the Local Assistant Examiner or Supervisor and the Board Examiners, the ordinal number of the candidate **MUST** be put on the front cover of the question book, i.e. in the instance quoted, candidate 16 will, have the ordinal number 5 on his booklet corresponding to the materials A_5, B_5, C_5 and D_5 he has had provided for him. This ordinal number is, of course, additional to the Board Examination number written by the candidate.
Lists of relative atomic masses should be available to the candidates (who are allowed to bring into the examination any books or notes).
Analytical Reagents (A.R.) chemicals should be provided wherever possible.
Electronic calculators may be used for calculations.
The simple investigation (Question 2) for each particular Group is based wholly on the chemicals prescribed for that particular Group by the Examiners. **Under no circumstances, therefore, may Local Assistant Examiners or Supervisors depart from these instructions by altering the wording of the paper or the identity of the chemicals to which the wording refers. If the chemicals prescribed are not available, the question paper for which they are specified must not be used. The question paper for another Group should be substituted.**
Further supplies of all materials (Questions 1 and 2) may be issued without penalty.

Local assistant examiners or supervisors are reminded that they are responsible for the safety of candidates during the examination.

COMMON LABORATORY APPARATUS AND CHEMICALS

The supervisor will assume that the following are available to all candidates:

Distilled water
Concentrated sulphuric acid
Concentrated nitric acid
Concentrated hydrochloric acid
Concentrated ammonia
Approximately 1 mol dm^{-3} aqueous sulphuric acid
Approximately 2 mol dm^{-3} aqueous nitric acid
Approximately 2 mol dm^{-3} aqueous sodium hydroxide
Approximately 2 mol dm^{-3} aqueous ammonia
Reagents and apparatus for testing of gases.

A supply of clean test tubes (including some suitable for heating solid), boiling tubes, litmus papers, stiring rod, dropping pipette, Bunsen burner, tripod and gauze, goggles, wash bottle, tissue paper.

GROUP ONE

Question 1

Each candidate must be provided with:

- Solid A which is a mixture of 2 g of anhydrous sodium carbonate and 1 g of sodium chloride (ratio of 2:1 by mass), supplied in a stoppered film cup, "solid A" but NOT NAMED
- Approximately 100-cm^3 of 2 M HCl (172 cm^3/ dm^3) labeled, Solution B.
- 100-cm^3 plastic cup.
- 250-cm^3 glass beaker.
- 0.1 or 0.2^o precision thermometer
- Stop watch

Question 2

Each candidate must be provided with:

- Approximately 2 g of solid C, labeled "C".

- Approximately 2 g of solid D, labeled "D".

- Approximately 2 g of solid E, labeled "E".

Candidates will also require:
1 M H_2SO_4, 0.5 M KI , 0.1 M $Na_2S_2O_3$, 2 M NaOH, red and blue litmus papers, 0.5 M $Pb(NO_3)_2$, 2 M NH_3 , 0.2 M $BaCl_2$, 2 M HCl, soda lime, neutral $FeCl_3$, crucible with lid, materials for flame test, distilled water, 5 pyrex test tubes.

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GROUP TWO

Question 1

Each candidate must be provided with:

- Weigh between 0.7 – 0.8 g of magnesium powder, supplied in a stoppered film cup, labeled "solid F".
- Approximately 100 cm^3 of 237.12 g dm^{-3} hydrated copper (II) sulphate, ($CuSO_4.5H_2O$) labeled, "Solution G".
- 100-cm^3plastic cup.
- 250-cm^3 glass beaker.
- 0.1 or 0.2° precision thermometer
- Stop watch

Question 2

Each candidate must be provided with

1- Approximately 2 g of solid H, "labeled H"

2- Approximately 2 g of solid I, "labeled I"

3- Approximately 2 g of solid J, "labeled J"

Candidates will also require:

2 M NaOH, 2 M HCl, 0.2 M $MgSO_4$, 2 M NH_3, solid $NaHCO_3$, , 0.2 M $BaCl_2$, aqueous neutral $FeCl_3$, , soda lime, methanol, conc H_2SO_4, red and blue litmus papers, crucible with lid, materials for flame test, distilled water, 5 pyrex test tubes.

Group 3

GROUP THREE

Question1

Each candidate must be provided with:

- Weigh between 2.1 – 2.3 g of zinc powder, supplied in a stoppered film cup, labeled "solid K".
- Approximately 100 cm^3 of 237.12 g dm^{-3} hydrated copper (II) sulphate, ($CuSO_4.5H_2O$) labeled, "Solution L."
- 100-cm^3 plastic cup.
- 250-cm^3 glass beaker.
- 0.1 or 0.2° precision thermometer
- Stop watch

Question 2

Each candidate must be provided with

- Approximately 2 g of solid M, labeled "M"
- Approximately 2 g of solid N, labeled "N"
- Approximately 2 g of solid O, labeled "O"

Candidates will also require:

2 M NaOH, conc H_2SO_4, 0.1 M $AgNO_3$, 1 M HNO_3, 2 M NH_3, 2 M HCl, conc HCl , aqueous $NaNO_2$, 2-naphthol dissolved in aq NaOH, red litmus papers and blue litmus papers, crucible with lid, materials for flame test, distilled water, 5 pyrex test tubes, ice-cold water.

GROUP FOUR

Question 1

Each candidate must be provided with:

- Solid P. Weigh between 2.70 and 2.9 g of $NaHCO_3$ in a stoppered film cup and label "solid P".
- Approximately 100 cm^3 of 2.00 mol dm^{-3} hydrochloric acid (172 cm^3/ dm^3) labeled, "Solution Q".
- 100-cm^3 plastic cup.
- 250-cm^3 glass beaker.
- 0.1 or 0.2^o precision thermometer
- Stop watch

Question 2

Each candidate must be provided with

- Approximately 2 g of solid R, labeled "R"
- Approximately 2 g of solid S, labeled "S"
- Approximately 10 cm^3 of liquid T, labeled "T"

Candidates will also require:

0.1 M $AgNO_3$, 1 M HNO_3, 2 M NH_3, aqueous chlorine (chlorine water), 2 M NaOH, 1 M H_2SO_4, 0.2 M $BaCl_2$, 2 M HCl, 0.5 M $NaHCO_3$, 0.5 M KI , sodium chlorate I (NaClO) prepared by mixing Parazone with water 50:50 ratio, 0,2M $K_2Cr_2O_7$, 2,4-dinitrophenylhydrazine, red and blue litmus papers, crucible with lid, materials for flame test, distilled water, 5 pyrex test tubes.