PAPER 1

Candidates should attempt ALL of the questions from Section A and ALL the questions from Section B.

Sections A carries 25% of the marks and Section B carries 75% of the marks. Within a section, each question carries equal weight. Candidates are advised to divide their time appropriately between Sections A and B: 40 minutes for Section A and 2 hours for Section B. This means spending 5 minutes per question from Section A and 30 minutes per question from Section B.

A Periodic Table, the structures of the amino acids and nucleotide bases, the values of physical constants, character tables and selected mathematical formulae will be found in the data book provided. Linear graph paper is available if required.

For Section A candidates should write their answers on to the paper following the question, continuing on the reverse side if needed. If additional sheets are needed, these should be secured to the relevant question, ensuring that the candidate number and the question number are written on each sheet. Candidates should make sure that their candidate number appears on each page they hand in. Each page of the question paper must be handed in, even if a question is not attempted.

For Section B the answers to each question should be returned separately, and a separate cover sheet for each question should be completed.

Write on ONE side of the paper only.

Calculator – students are permitted to use an approved calculator.

STATIONERY REQUIREMENTS

Graph paper (4 sheets)
Lined paper
Rough work pad

SPECIAL REQUIREMENTS

Department of Chemistry Data Book
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SECTION B

A1 Inorganic I: Structure and bonding

9

Answer all parts of the question.

(a)
10

Answer *all* parts of the question.

(a)
A2 The foundations of organic synthesis

11

Answer *all* parts of the question.

(a)
Answer \textit{all} parts of the question.

(a)

END OF PAPER
PAPER 2A

Candidates should attempt ALL of the questions from Section A and ALL the questions from Section B.

Sections A carries 25% of the marks and Section B carries 75% of the marks. Within a section, each question carries equal weight. Candidates are advised to divide their time appropriately between Sections A and B: 40 minutes for Section A and 2 hours for Section B. This means spending 5 minutes per question from Section A and 30 minutes per question from Section B.

A Periodic Table, the structures of the amino acids and nucleotide bases, the values of physical constants, character tables and selected mathematical formulae will be found in the data book provided. Linear graph paper is available if required.

For Section A candidates should write their answers on to the paper following the question, continuuing on the reverse side if needed. If additional sheets are needed, these should be secured to the relevant question, ensuring that the candidate number and the question number are written on each sheet. Candidates should make sure that their candidate number appears on each page they hand in. Each page of the question paper must be handed in, even if a question is not attempted.

For Section B the answers to each question should be returned separately, and a separate cover sheet for each question should be completed.

Write on ONE side of the paper only.

Calculator – students are permitted to use an approved calculator.

STATIONERY REQUIREMENTS
Graph paper (4 sheets)
Lined paper
Rough work pad

SPECIAL REQUIREMENTS
Department of Chemistry Data Book

You may not start to read the questions printed on the subsequent pages of this question paper until instructed that you may do so by the Invigilator.

During the first 10 minutes of the examination you are permitted to read the paper, but you may not start writing your answers until this time has elapsed.
SECTION B

A3 High-resolution molecular spectroscopy

21

Answer all parts of the question.

(a)
22

Answer *all* parts of the question.

(a)
Answer all parts of the question.

(a)
24

Answer *all* parts of the question.

(a)

END OF PAPER
Candidates should attempt ALL of the questions from Section A and ALL the questions from Section B.

Sections A carries 25% of the marks and Section B carries 75% of the marks. Within a section, each question carries equal weight. Candidates are advised to divide their time appropriately between Sections A and B: 40 minutes for Section A and 2 hours for Section B. This means spending 5 minutes per question from Section A and 30 minutes per question from Section B.

A Periodic Table, the structures of the amino acids and nucleotide bases, the values of physical constants, character tables and selected mathematical formulae will be found in the data book provided. Linear graph paper is available if required.

For Section A candidates should write their answers on to the paper following the question, continuing on the reverse side if needed. If additional sheets are needed, these should be secured to the relevant question, ensuring that the candidate number and the question number are written on each sheet. Candidates should make sure that their candidate number appears on each page they hand in. Each page of the question paper must be handed in, even if a question is not attempted.

For Section B the answers to each question should be returned separately, and a separate cover sheet for each question should be completed.

Write on ONE side of the paper only.

Calculator – students are permitted to use an approved calculator.

STATIONERY REQUIREMENTS
Graph paper (4 sheets)
Lined paper
Rough work pad

SPECIAL REQUIREMENTS
Department of Chemistry Data Book

You may not start to read the questions printed on the subsequent pages of this question paper until instructed that you may do so by the Invigilator.

During the first 10 minutes of the examination you are permitted to read the paper, but you may not start writing your answers until this time has elapsed.
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SECTION B

A6 Concepts in physical chemistry

33

Answer *all* parts of the question.

(a)
Answer *all* parts of the question.

(a)
Answer *all* parts of the question.

(a)
36

Answer *all* parts of the question.

(a)

END OF PAPER
PAPER 3

Candidates should attempt FOUR questions.

Where a question is divided into sections, the approximate division of marks between sections is indicated at the end of the question.

Linear graph paper is available if required.

A Periodic Table, the structures of the amino acids and nucleotide bases, the values of physical constants, character tables and selected mathematical formulae will be found in the data book provided.

Write on ONE side of the paper only.

The answers to each question should be returned separately.

A separate cover sheet for each question should be completed.

Calculator – students are permitted to use an approved calculator.

STATIONERY REQUIREMENTS

Graph paper (4 sheets)
Lined paper
Rough work pad

SPECIAL REQUIREMENTS

Department of Chemistry Data Book

You may not start to read the questions printed on the subsequent pages of this question paper until instructed that you may do so by the Invigilator.

During the first 10 minutes of the examination you are permitted to read the paper, but you may not start writing your answers until this time has elapsed.
Answer *all* parts of the question.

(a)
38

Answer all parts of the question.

(a)
B2 Structure and reactivity

39

Answer all parts of the question.

(a)
40

Answer all parts of the question.

(a)
B3 Chemical biology I: Biological catalysis

41

Answer *all* parts of the question.

(a)
42

Answer all parts of the question.

(a)
Answer *all* parts of the question.

(a)
44

Answer *all* parts of the question.

(a)
B5 Biomaterials

45

Answer *all* parts of the question.

(a)
46

Answer all parts of the question.

(a)
Answer all parts of the question.

(a)
48

Answer *all* parts of the question.

(a)
B7 Further quantum mechanics

49

Answer \textit{all} parts of the question.

(a)

END OF PAPER
PAPER 4

Candidates should attempt FOUR questions.

Where a question is divided into sections, the approximate division of marks between sections is indicated at the end of the question.

Linear graph paper is available if required.

A Periodic Table, the structures of the amino acids and nucleotide bases, the values of physical constants, character tables and selected mathematical formulae will be found in the data book provided.

Write on ONE side of the paper only.

The answers to each question should be returned separately.

A separate cover sheet for each question should be completed.

Calculator – students are permitted to use an approved calculator.

You may not start to read the questions printed on the subsequent pages of this question paper until instructed that you may do so by the Invigilator.

During the first 10 minutes of the examination you are permitted to read the paper, but you may not start writing your answers until this time has elapsed.
C1 Electrochemistry

Answer all parts of the question.

(a)
C2 EPR and magnetism

51

Answer all parts of the question.

(a)
C3 NMR

52

Answer all parts of the question.

(a)
Answer all parts of the question.

(a)
54

Answer all parts of the question.

(a)
C5 Control in organic chemistry

55

Answer all parts of the question.

(a)
56

Answer *all* parts of the question.

(a)
C6 Diffraction methods in chemistry

57

Answer all parts of the question.

(a)
58

Answer all parts of the question.

(a)
Answer *all* parts of the question.

(a)
Answer *all* parts of the question.

(a)
C8 Electronic structure

61

Answer all parts of the question.

(a)
62

Answer *all* parts of the question.

(a)
Answer all parts of the question.

(a)
64

Answer *all* parts of the question.

(a)
C10 Surfaces and interfaces

65

Answer all parts of the question.

(a)
66

Answer all parts of the question.

(a)
Answer all parts of the question.

(a)