PHYSICAL SCIENCES

PAPER 1

QUESTION 2: NEWTON'S LAWS OF MOTION

- Drawing a labelled free body diagram (3)
- Stating one of the Newton's law of motion (2)
- About 2 calculations, at least 2 marks for the formulae + 2 marks for substitution (4)

[9]

TIPS

- ❖ Emphasise the use of simultaneous equations

QUESTION 3: VERTICAL PROJECTILE MOTION

- 2/3 calculations, formulae and substitution (4)
- Using information from the graph/ drawing a graph (2)

[6]

TIPS

- ❖ Sign conventions
- ❖ Differentiate between Δt and t
- ❖ Show frame of reference
- ❖ Emphasise drawing and interpretation of graphs

QUESTION 4: MOMENTUM

- Defining a term/stating a law/ principle (Impulse, elastic/non-elastic collision, principle of linear momentum) (2)
- 2/3 calculations (4)

[6]

TIPS

- ❖ Be able to identify the initial and final velocity
- ❖ Emphasise subscripts and understand what they mean especially net in $F_{net}\Delta t=\Delta p$

QUESTION 5: WORK, ENERGY & POWER

- Defining a term/ stating a law/principle (Conservative/non-conservative force, Conservation of mechanical energy) (2)
- 2/3 calculations (4)

[6]

TIPS

- ❖ Label free body diagrams with arrows starting from the point
- ❖ Correct choice of formulae
- ❖ Differentiate between W_{net} & F_{net}
- ❖ Differentiate between $W = F\Delta x Cos$

QUESTION 6: DOPPLER EFFECT

- Defining a term (Doppler effect)   (2)
- Calculation   (3)

    [5]

TIPS

- ❖ Write the correct formula from the data sheet and know each symbol
- ❖ Mathematical manipulation

QUESTION 7: ELECTROSTATICS (COULOMBS LAW)

- Defining a term/ stating a law (Coulombs law, electric field)   (2)
- Direction of the electric field   (1)
- Calculation   (3)

    [6]

TIPS

- ❖ Integrate with Newton's laws concepts
- ❖ Labelling of forces

QUESTION 8: ELECTROSTATICS (ELECTRIC FIELDS)

- Defining a term/ stating a law (Ohm's law)   (2)
- Calculation   (3)
- Interpreting a graph/using information from the graph

    [5]

TIPS

- ❖ Choice of formulae
- ❖ Direction of the net field
- ❖ Emphasise the vector nature of electric fields

QUESTION 9: ELECTRIC CIRCUITS

- Calculation (3)
- Using information from the graph

[3]

TIPS

- ❖ Choice of formulae
- ❖ Mathematical manipulation
- ❖ Use of correct units
- ❖ Application of Ohm's law
- ❖ Differentiate between EMF and potential difference
- ❖ Do the experiments stated in CAPS

QUESTION 10: ELECTRODYNAMICS

- 2/3 calculations (4)

[4]

TIPS

- ❖ Know the difference between AC & DC circuits
- ❖ Emphasise the use of subscripts
- ❖ Be able to interpret Faraday's law

QUESTION 11: PHOTOELCTRIC EFFECT

- Defining a term (Work function, threshold frequency, cut-off frequency) (2)
- 2/3 calculations (4)
- Making use of the graph

[6]

TIPS

- ❖ Relate the gradient to hc
- ❖ Be able to use the graph to determine the threshold frequency and Planck's constant

TOTAL = 56/150

37%

NB: NOT INCLUSIVE OF MULTIPLE CHOICE QUESTIONS. 4 marks from MCQ will add up to 60/150= 40%

PHYSICAL SCIENCES P 2

QUESTION 2, 3 & 4: INORGANIC MOLECULES

- Functional groups, homologous series
- IUPAC naming, formulae of compounds
  (2)
- Structural formulae   (2)
- Definitions of terms. hydrocarbon, isomer, saturated, unsaturated, functional group etc
  (2)
- Positional , functional and structural isomers   (2)
- Reaction conditions and types of reactions   (2)
- Dependant and independent variables   (2)
- Polymerisation, addition and condensation polymers (differentiate)   (2)
- Intermolecular forces   at least   (2)
- Reactants and products of combustion and balancing the equations   (3)
                                                                          ±   [20]

NB: THE FOLLOWING DOES NOT NECESARILY MEAN THAT ALL THE QUESTIONS WOULD BE ASKED

QUESTION 5: RATE OF REACTIONS

- Experiment investigating factors that influence the reaction rate   (2)
- Interpreting the graph/table   (2)
- Balancing equations, stating if they are exothermic or endothermic   (3)
- Calculation   at least   (2)
                                                                          ±   [9]

TIPS

- ❖ Revise stoichiometric calculations
- ❖ Emphasise skills for interpreting the graphs
- ❖ The use of the correct formulae

QUESTION 6: CHEMICAL EQUILIBRIUM

- Stating Le Chateliers principle   (2)
- Defining terms, reaction rate, reversible reaction, chemical/dynamic equilibrium (2)
- K_c calculation, at least 4 marks from the K_c expression, 2 from the table and 1 from Substitution   (4)

                                                                          ±   [8]

TIPS

- ❖ Identify the disturbance
- ❖ State which reaction will be favoured when opposing the disturbance
- ❖ The effect on what happens to the number of moles of the products etc
- ❖ Different methods of calculating K_c
- ❖ Drawing of Boltzmann distribution curve

QUESTION 7: ACIDS AND BASES

- Defining terms, acid and bases according to Lowry Bronsted/Arhenius, Ampholyte
  Mono & diprotic acids (2)
- Conjugate acids/bases (2)
- Know why acids are weak/strong/monoprotic and diprotic (1)
- Know all the apparatuses for titration (2)
- Calculation, at least 3 marks (3)
  ± [10]

TIPS

- ❖ Emphasise the use of correct formulae and substitution

QUESTION 8: ELECTROCHEMICAL CELLS

- Functions of the salt bridge (2)
- Standard conditions under which a cell functions (2)
- Cell notations at least (2)
- Oxidising/reducing agents(name/formula) at least (1)
- Energy conversions (1)
- Calculating the EMF at least 3 marks (3)
  ± [11]

QUESTION 9: ELECTROLYTIC CELL

- Defining terms, electrolyte, electrolysis (2)
- Writing ½ reactions (2)
- Oxidising/reducing agents(name/formula) (2)
- Type of electrode cathode/anode (1)
  [7]

TIPS Q 8 & 9

- ❖ Emphasise the writing of ½ reactions, the use of double arrows
- ❖ Master the use of the table of standard reduction potentials

QUESTION 10: FERTILIZERS

• Table	
• Writing a balanced equation	(3)
• Industrial preparations	(1)
• Name/formula of the catalysts, acids, fertilizers	(1)
• Calculations	(2)
	[7]

TIPS

- ❖ Know all the industrial processes
- ❖ Be able to use ratios in calculations
- ❖ Emphasise conversions