




KWAZULU-NATAL PROVINCE

EDUCATION
REPUBLIC OF SOUTH AFRICA

PHYSICAL SCIENCES
SCOPE FOR EXAMINATIONS 2024: GRADE 12

MARCH CONTROLLED TEST (100 marks)			
PAPER	TOPICS	MARK	DURATION
ONE PAPER ONLY	<u>Mechanics</u> Momentum & Impulse: <ul style="list-style-type: none"> ✓ Momentum, Newton's second law expressed in terms of Momentum, ✓ Conservation of momentum and Elastic and Inelastic collisions. Vertical Projectile Motion in One Dimension (1D): <ul style="list-style-type: none"> ✓ represented in words, diagrams, equations and graphs Grade 11 Work <ul style="list-style-type: none"> ✓ Newton's Laws (Newton 1, 2, 3) ✓ Newton's Law of Universal Gravitation) ✓ Applications of Newton's Laws 	50	2 hours
	<u>Matter and Materials</u> Organic molecules: <ul style="list-style-type: none"> ✓ Organic molecular structures - functional groups, saturated and unsaturated structures, isomers ✓ IUPAC naming and formulae ✓ Structure physical property relationships ✓ Applications of organic chemistry - Substitution, addition and elimination. (ONLY alkanes, alkenes, alkynes, alcohols, haloalkanes, carboxylic acids, and esters) Grade 11 Work <ul style="list-style-type: none"> ✓ Inter-molecular forces <p><u>NB:</u> Quantitative aspects of chemical change may be assessed across chemistry.</p>	50	

JUNE EXAMINATION (2 PAPERS)			
PAPER	TOPICS	MARKS	DURATION
 PAPER 1	<p>Momentum & Impulse:</p> <ul style="list-style-type: none"> ✓ Momentum, Newton's second law expressed in terms of Momentum, ✓ Conservation of momentum and Elastic and Inelastic collisions. <p>Vertical projectile motion in one dimension (1D):</p> <ul style="list-style-type: none"> ✓ represented in words, diagrams, equations and graphs <p>Grade 11 Work</p> <ul style="list-style-type: none"> ✓ Newton's Laws (Newton 1, 2, 3 and Universal Gravitational Law) ✓ Applications of Newton's Laws <p>Work, Energy & Power:</p> <ul style="list-style-type: none"> ✓ Definition of Work, ✓ Work Energy Theorem ✓ Conservation of energy with non-conservative forces ✓ Power <p>Waves, Sound and Light: Doppler Effect</p> <ul style="list-style-type: none"> ✓ Doppler Effect Calculations ✓ Application with sound and ultrasound, ✓ Application with light – blue shifts and red shifts in the universe (Evidence for the expanding universe). 	100	2 Hours
PAPER 2	<p>Organic molecules</p> <ul style="list-style-type: none"> ✓ Organic molecular structures - functional groups, saturated and unsaturated structures, isomers ✓ IUPAC naming and formulae ✓ Structure physical property relationships ✓ Applications of organic chemistry - Substitution, addition and elimination. (ONLY alkanes, alkenes, alkynes, alcohols, haloalkanes, carboxylic acids, and esters) ✓ Calculations (Quantitative aspects of chemical changes) <p>Chemical Change</p> <p>Rate and Extent of Reaction:</p> <ul style="list-style-type: none"> ✓ Rates of reaction ✓ factors affecting rate (nature of reacting substances, concentration [pressure for gases], temperature and presence of a catalyst) ✓ Measuring rates of reaction; Mechanism of reaction and of catalysis ✓ Calculations (Quantitative aspects of chemical changes) <p>Chemical Equilibrium:</p> <ul style="list-style-type: none"> ✓ Chemical equilibrium ✓ Factors affecting equilibrium ✓ Equilibrium constant ✓ Application of equilibrium principles. <p>Acids and Bases:</p> <ul style="list-style-type: none"> ✓ Definitions, strong and weak, concentrated and dilute, conjugate acid-base pairs, neutralization, titrations ✓ pH calculations ✓ Dilution and neutralization ✓ Acid-base reactions ✓ Calculations (Quantitative aspects of chemical changes) 	100	2 hours

PREPARATORY EXAMINATIONS

FORMAT OF QUESTION PAPERS

Paper 1: Physics 3 hours	Paper 2: Chemistry 3 hours
SECTION A: Multiple-choice questions	SECTION A: Multiple-choice questions
SECTION B: Conceptual questions assessing all themes	SECTION B: Conceptual questions assessing all themes
Total: 150 marks	Total: 150 marks

Note: Full Papers will be written, including selected examinable Grades 10 & 11 Topics (p.149 CAPS Document)

MARK ALLOCATION PER KNOWLEDGE AREA

	Knowledge Area	Theme	Marks
PAPER 1	Mechanics ($\pm 43,3\%$)	Newton's Laws (1,2,3) and Law of Gravitation	65
		Momentum (1D), Impulse and change in momentum	
		Vertical projectile motion (1D)	
		Work, power and energy	
	Waves, sound and light ($\pm 10\%$)	Doppler effect	15
	Electricity and Magnetism ($\pm 36,7\%$)	Electrostatics (Grade 11)	55
		Electric circuits (Grades 11 & 12)	
		Electrodynamics Grade 12	
		Electromagnetic radiation Grade 12	
	Matter and materials (10%)	Optical phenomena and properties of materials	15
	TOTAL		150
PAPER 2	Knowledge Area	Theme	Marks
	Matter and materials ($\pm 38,7\%$)	Organic molecules	58
	Chemical change ($\pm 61,3\%$)	Rate and extent of reaction	92
		Chemical Equilibrium	
		Acids and Bases	
		Electrochemistry and Electrochemical cells	
	TOTAL		150

COGNITIVE LEVELS

Cognitive level description	Weighting %	
	Paper 1	Paper 2
Remembering	15	15
Understanding	35	40
Applying and Analysing	40	35
Evaluating	10	10