2.6 A2 UNIT 6

Unit 6: Further Mechanics B
Written examination: 1 hour 45 minutes
25% of A level qualification
80 marks

Candidates will choose **either** Unit 5 **or** Unit 6.

The subject content is set out on the following pages. There is no hierarchy implied by the order in which the content is presented, nor should the length of the various sections be taken to imply any view of their relative importance.

Candidates will be expected to be familiar with the knowledge, skills and understanding implicit in A Level Mathematics.

Topics	Guidance
2.6.1 Rectilinear motion	
Form and solve simple equations of motion in which (i) acceleration is given as a function of time, displacement or velocity, (ii) velocity is given as a function of time or displacement.	To include use of $\dfrac{\mathrm{d}^2 x}{\mathrm{d}t^2} = \dfrac{\mathrm{d}v}{\mathrm{d}t} = v\dfrac{\mathrm{d}v}{\mathrm{d}x}$.
2.6.2 Momentum and Impulse	
Understand and use momentum and impulse in two dimensions, using vectors.	

Topics	Guidance
2.6.3 Moments and Centre of Mass	
Understand and use the centre of mass of a coplanar system of particles.	Candidates will be expected to be familiar with the term 'centre of gravity'.
Understand and use the centre of mass of uniform laminae: triangles, rectangles, circles, semicircles, quarter-circles and composite shapes.	
Solve problems involving simple cases of equilibrium of a plane lamina and/or a coplanar system of particles connected by light rods.	The lamina or system of particles may be suspended from a fixed point.
Understand and use the centre of mass of uniform rigid bodies and composite bodies.	The use of symmetry and/or integration to determine the centre of mass of a uniform body.
2.6.4 Equilibrium of Rigid Bodies	
Understand and use the equilibrium of a single rigid body under the action of coplanar forces where the forces are not all parallel.	Problems may include rods resting against rough or smooth walls and on rough ground. Consideration of jointed rods is not required. Questions involving toppling will not be set.
2.6.5 Differential Equations	
Use differential equations in modelling in kinematics.	To include the use of first and second order differential equations.
Understand and use simple harmonic motion.	Candidates will be expected to set up the differential equation of motion, identify the period, amplitude and appropriate forms of solution. Candidates may quote formulae in problems unless the question specifically requires otherwise. Questions may involve light elastic strings or springs. Questions may require the refinement of the mathematical model to include damping. Angular S.H.M. is not included.