Module M1.1 Force as a vector Topic 4 M1. Topic 9 M1. 8 hours.	**Content & Page Reference M1 textbook** • Find and use perpendicular components of a force, eg in finding the resultant of a system of forces, or to calculate the magnitude and direction of a force (knowledge of column vector or **i**, **j** notation is not required, though candidates are free to use any such notation in answering questions if they wish). ***Ex 4A p47-49 & Ex 4B p53-55*** • Understand the term 'resultant' as applied to two or more forces acting at a point, and use vector addition in solving problems involving resultants and components of forces (soloutions involving calculation, rather than scale drawing, will be expected). ***Ex 9A p131-134 & Ex 9B p139-140*** • Understand the vector nature of force, and use directed line segments to represent forces (acting in at most two dimensions). ***Implicit in all the above work. Please emphasize as you cover this area and M1.2.***	**Time** 4 hours 4 hours.

Module M1.2 Equilibrium of a particle. Topic 10 M1. Topic 5 M1. Topic 7 M1. 7 hours.	• Identify the forces acting in a given situation, and use the relationship between mass and weight. ***Ex 3A p34-36 Q1,2.*** • Understand and use the principle that a particle is in equilibrium if and only if the vector sum of the forces acting is zero, or equivalently if and only if the sum of the resolved parts in any given direction is zero (problems may involve resolution of forces in direction(s) to be chosen by the candidate or use of a 'triangle of forces'). ***Ex 10A p148-150*** • Use the model of a 'smooth' contact and understand the limitations of the model. ***Implicit in Topic 5.*** • Represent the contact force between two rough surfaces by two components, the 'normal force' and the 'frictional force', understand the concept of limiting friction and limiting equilibrium, recall the definition of coefficient of friction, and use the relationship $F \leq \mu R$ or $F = \mu R$. ***Ex 5A p66-68 & Ex 5B p71-73.*** • Use Newton's third law. ***Ex 7A p99-101***	2 hours. 3 hours. 2 hours.

Module M1.3 Kinematics of Motion in a Straight Line. Topic 1 M1. Topic 11 M1. 6 hours.	• Understand the concepts of distance and speed as scalar quantities, and of displacement, velocity and acceleration as vector quantities (in one dimension only). • Use appropriate formula for motion with constant acceleration. ***Ex 1A p3-4, Ex 1B p7-8 & Ex 1C p10-11.*** • Sketch and interpret (t,x) and (t,v) graphs, and in particular understand and use the facts that the area under a (t,v) graph represents displacement, the gradient of a (t,x) graph represents velocity and the gradient of a (t,v) graph represents acceleration. ***Ex 1D p15-16.*** • Use differentiation and integration with respect to time to solve simple problems concerning displacement, velocity and acceleration. ***Ex 11A p162-163 & Ex 11B p167-170.***	3 hours. 3 hours.

Module M1.4 Newton's Laws of Motion. Topic 2 M1. Topic 7 M1. Topic 3 M1. Topic 6 M1. 11 hours.	• Apply Newton's laws of motion to the linear motion of bodies of constant mass moving under the action of constant forces (which may include friction); for example a car pulling a caravan. ***Ex 2A p23-24, Ex 2B p27-28 & Ex 7C p111-112.***	3 hours.
	• Model, in suitable circumstances, the motion of a body moving vertically or on an inclined plane, as motion with constant acceleration and understand any limitations to this model. ***Ex 3A p34-35, Ex 3B p40-41, Ex 6A p78, Ex 6B p81-82 & Ex 6C p87-88.***	6 hours.
	• Solve simple problems which may be modelled as the motion of two particles, connected by a light inextensible string which may pass over a fixed smooth peg or light pulley (including, for example, situations in which a pulley is placed at the top of an inclined plane). ***Ex 7B p107-108.***	2 hours.

Module M1.5 Linear Momentum.	• Recall and use the definition of linear momentum and show understanding of its vector nature. ***Ex 8A p119-120.***	1 hour.
	• Understand and use conservation of linear momentum in simple applications involving the direct collision of two bodies moving in the same straight line before and after impact, including the case where the bodies coalesce (knowledge of impulse and the coefficient of restitution is not required). ***Ex 8B p122-123.***	2 hours.