Practice Question Set For GCSE
Subject : Physics
Paper-1 Topic : Motion And Forces

Name of the Student:_____
Max. Marks : 18 Marks **Time : 18 Minutes**

Mark Schemes

Q1.

Question number	Answer	Additional guidance	Mark
	An explanation linking any four from force(s) associated with change(s) in momentum (use of Newton's second law) (1) detail of momentum changes, involving time (1) time of collision is same for both (1) (therefore) momentum change is the same for both (1) equal and opposite forces mean equal and opposite momentum changes (1) (total) momentum before a collision = (total) momentum after collision (1) (conservation of momentum requires) no external forces acting (1)	$F = \frac{(mv-mu)}{t}$ $F=ma$ $\frac{m_1v_1 - m_1u_1}{t} = -\frac{(m_2v_2 - m_2u_2)}{t}$ with explanation leading to $m_1u_1 + m_2u_2 = m_1v_1 + m_2v_2$ for both marks	**(4) Exp**

Q2.

Question	Answer	Additional guidance	Mark
	explanation linking mass/(change of/initial/final) velocity/(change of) momentum (1) with a consistent equation linking chosen factor to force (1)	 accept speed/acceleration do not accept weight second marking point dependent on first marking point relevant equations are: $F = ma$ $F = \frac{mv - mu}{t}$ $F = \frac{\Delta p}{t}$ $F = \frac{m\Delta v}{t}$	**2 AO2.1**

Q3.

Question number	Indicative content	Mark
*	The indicative content below is not prescriptive and candidates are not required to include all of the material which is indicated as relevant. Additional content included in the response must be scientific and relevant. **A01 (6 marks)** • force needed to keep an object moving in a circle • when moving in a circle, direction of velocity changes • must be an acceleration • moving in a straight line with no resultant force at constant velocity **A02 (6 marks)** • the woman changing direction while circling the man • she is changing velocity (but not changing speed) • therefore she is accelerating • this requires a force towards the centre of her orbit • this is a centripetal force • when the man releases the woman, the centripetal force ceases • there is no resultant force on the woman (if friction from the ice can be ignored) • the woman therefore continue in a straight line • she is now travelling at a constant velocity	**(6)**

Level	Mark	Descriptor
	0	No awardable content
Level 1	1-2	• Demonstrates elements of physics understanding, some of which is inaccurate. Understanding of scientific ideas lacks detail. (AO1) • The explanation attempts to link and apply knowledge and understanding of scientific ideas, flawed or simplistic connections made between elements in the context of the question. (AO2)
Level 2	3-4	• Demonstrates physics understanding, which is mostly relevant but may include some inaccuracies. Understanding of scientific ideas is not fully detailed and/or developed. (AO1) • The explanation is mostly supported through linkage and application of knowledge and understanding of scientific ideas, some logical connections made between elements in the context of the question. (AO2)
Level 3	5-6	• Demonstrates accurate and relevant physics understanding throughout. Understanding of the scientific ideas is detailed and fully developed. (AO1) • The explanation is supported throughout by linkage and application of knowledge and understanding of scientific ideas, logical connections made between elements in the context of the question. (AO2)

Q4.

Question number	Answer	Additional guidance	Mark
	An explanation that combines up to 3 points of application of knowledge and reasoning/justification • Momentum increased if final velocity can be increased (1) • Distance (while in athlete's hand) is greater (1) • Time whilst subject to force is longer (1) • using the equation F = (mv-mu)/t (1)	Ignore references to shot after it has left the athletes hand accelerating for a longer time use of v = u + at or use of $v^2-u^2 = 2xaxd$	**(3)**

Q5.

Question number	Answer	Additional guidance	Mark
CS4	An explanation linking three of: acceleration increases (1) as F = ma (1) (and) mass decreases (1) due to burning/using fuel (1)	 independent mark	**(3)** **AO1**