PHYSICS 101 - ANSWER KEY (Total: 25 marks)

Question 1: (5 marks)
Define Newton's Three Laws of Motion.
- First Law: An object at rest stays at rest, and an object in motion stays in motion unless acted upon by an external force. (2 marks)
- Second Law: Force equals mass times acceleration (F = ma). (1 mark)
- Third Law: For every action, there is an equal and opposite reaction. (2 marks)

Question 2: (8 marks)
Calculate the force required to accelerate a 1500 kg car from 0 to 27 m/s in 9 seconds.
- Correct formula used: F = ma (1 mark)
- Correct calculation of acceleration: a = (27 - 0)/9 = 3 m/s² (3 marks)
- Correct substitution: F = 1500 × 3 (2 marks)
- Correct answer: F = 4500 N (2 marks)

Question 3: (12 marks)
Draw and explain the motion of a simple pendulum, including the energy conversions involved.
- Clear diagram showing pendulum motion (3 marks)
- Explanation of oscillatory motion (3 marks)
- Description of forces acting on the pendulum (3 marks)
- Explanation of potential and kinetic energy conversions (3 marks)