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**1.** Two particles, $P$ and $Q$, with masses $m$ and $2m$ respectively, are moving in the same direction along the same straight line when they collide directly. Immediately before they collide, $P$ is moving with speed $4u$ and $Q$ is moving with speed $u$. Immediately after they collide, both particles are moving in the same direction and the speed of $Q$ is four times the speed of $P$.

(a) Find the speed of $Q$ immediately after the collision.

**(3)**

(b) Find the magnitude of the impulse exerted by $Q$ on $P$ in the collision.

**(3)**

(c) State clearly the direction of this impulse.

**(1)**

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**Question 1 continued**

**Q1**

**(Total 7 marks)**