8. Three particles A, B and C, each of mass m, lie at rest in a straight line L on a smooth horizontal surface, with B **between** A and C.

Particles A and B are projected directly **towards** each other with speeds $5u$ and $4u$ respectively.

At the same instant, particle C is projected directly **away** from B with speed $3u$.

In the subsequent motion, A, B and C move along L.

Particles A and B collide directly.

The coefficient of restitution between A and B is e.

(a) Find

(i) the speed of A immediately after the collision,

(ii) the speed of B immediately after the collision.

(7)

Given that the direction of motion of A is **reversed** in the collision between A and B, and that there is **no** collision between B and C,

(b) find the set of possible values of e.

(4)

(Total for Question 8 is 11 marks)

TOTAL FOR PAPER IS 75 MARKS