Previous Year JEE Problems

The increasing order (lowest first) for the values of e/m (charge/mass) for electron (e), proton (p), neutron (n) and alpha particle (α) is   **(1984, 1M)**

(a) e, p, n, α (b) n, p, e, α

(c) n, p, α, e (d) n, α, p, e

Neutron has no charge, hence e/m is zero for neutron. Next, α-particle (He^{2+}) has very high mass compared to proton and electron, therefore very small e/m ratio. Proton and electron have same charge (magnitude) but former is heavier, hence has smaller value of e/m.

$$\frac{e}{m} : \ n < \alpha < p < e$$