

# 2021 Ph H1 Q15

**Section:** Particles and Waves

**Topic:** The Standard Model

## Brief summary of the question

Which set of quarks makes up a neutron?

## Worked solution

- A neutron is a baryon (made of three quarks).
- Its quark composition is: one up quark and two down quarks.
- Symbolically: udd.

## Final answer

D — up, down, down.

## Revision tips

Proton: uud.

Neutron: udd.

Charge of up quark =  $+\frac{2}{3} e$ ; down quark =  $-\frac{1}{3} e$ .

Total charge of neutron:  $(+\frac{2}{3}) + (-\frac{1}{3}) + (-\frac{1}{3}) = 0$ .