

Question Number	Answer	Mark
11(a)	<ul style="list-style-type: none"> Quark and anti-quark (1) <p>[Accept $q\bar{q}$, ignore correct examples such as $u\bar{d}$, do not accept 'quarks and antiquarks']</p>	1
11(b)	<p>Any one from</p> <ul style="list-style-type: none"> Leptons are fundamental (particles) They cannot be broken down (into smaller particles) They have a lepton number $\neq 0$ Lepton number = 1 or -1 $L = 1$ or -1 They have a baryon number = 0 $B = 0$ (1) <p>[Accept – not subject to strong (nuclear) force] [Accept – subject to weak force]</p>	1
11(c)	<ul style="list-style-type: none"> Charge on X must be 0 (1) Or X is neutral Lepton number of a pion is 0 (1) Muon has a lepton number of +1 (1) X must have a lepton number of -1 (1) <p>4th mark dependent on all four points and a conclusion that the student is correct</p> <p>[Baryon number of X = 0 – not necessary for deduction, but accept as 1 mark alternative if MP1,2,3,4 not awarded]</p>	4
Total for question 11		6