

Question Number	Answer	Mark															
1 (a)	$\Lambda^0 \rightarrow e^+ + e^-$ (No. 2) (1) Baryon number not conserved (1) $\Lambda^0 \rightarrow e^+ + e^-$ (No. 4) (1) Momentum or energy cannot be conserved (1) $\Lambda^0 \rightarrow p + \pi^0$ (1) Charge is not conserved (1)	6															
1 (b)	Convert to eV using $e = 1.6 \times 10^{-19} \text{C}$ (1) Divides by $c^2 (3 \times 10^8)^2$ (1) Mass = $2.0 \times 10^{-27} \text{ kg}$ (1)	3															
Total for question		9															
2 (a)	<b>B</b> – anti up $-2/3$ + down $-1/3 = -1$	1															
2 (b)	<table border="1"> <thead> <tr> <th>Meson</th> <th>Charge /e</th> <th>Strangeness</th> </tr> </thead> <tbody> <tr> <td><math>K^0</math></td> <td>0</td> <td>-1</td> </tr> <tr> <td><math>\bar{K}^0</math></td> <td>0</td> <td>+1</td> </tr> <tr> <td><math>K^+</math></td> <td>+1</td> <td>+1</td> </tr> <tr> <td><math>K^-</math></td> <td>-1</td> <td>-1</td> </tr> </tbody> </table>	Meson	Charge /e	Strangeness	$K^0$	0	-1	$\bar{K}^0$	0	+1	$K^+$	+1	+1	$K^-$	-1	-1	4 – one for each row
Meson	Charge /e	Strangeness															
$K^0$	0	-1															
$\bar{K}^0$	0	+1															
$K^+$	+1	+1															
$K^-$	-1	-1															
2 (c)	Different mass/lifetimes/decay products	1															
Total for question		6															